

American Artisan and Hardware A Record

Sheet Metal Work-Warming Heating

Vol. 94, No. 22

CHICAGO, NOVEMBER 26, 1927

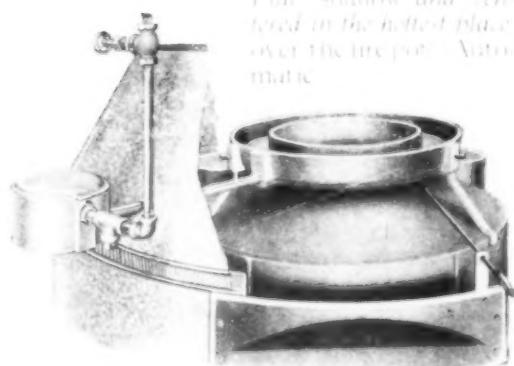
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Warm Air Furnace
Annual

INTEREST in the Warm Air Heating Industry this year is very keen. There are dozens of vital questions on which both manufacturers and warm air heating contractors would like more light. Dozens of questions which all would like answered.

This Annual will tell you what the other fellow thinks about the future of the warm air heating business—it will tell you what the other fellow did in 1927—and how he did it.

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The 34th Warm Air Furnace Annual will be issued on December 31st This means that you should make your space reservations NOW.

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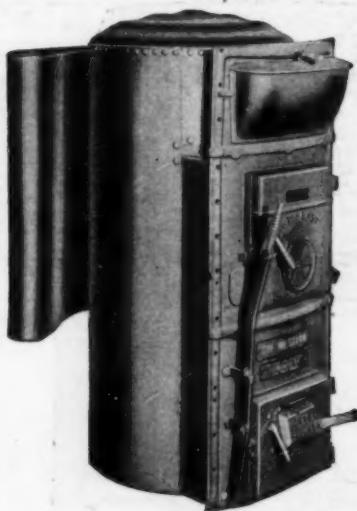
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Right—Western Furnace knocked down after assembly and crated for shipment.



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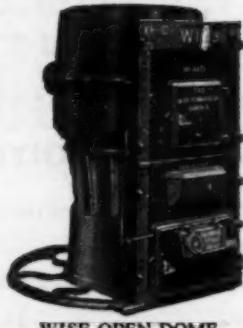
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Wise leadership in
bringing out—*

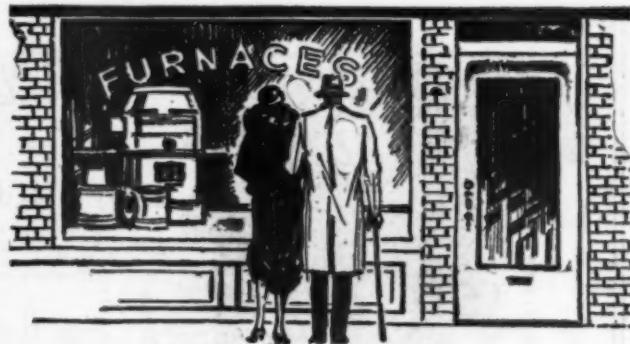
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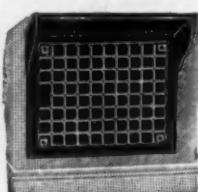
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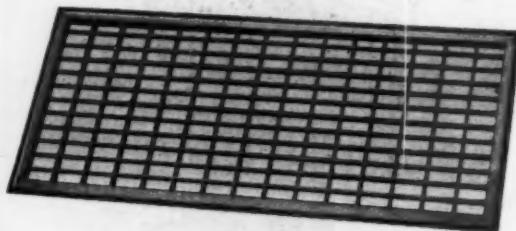
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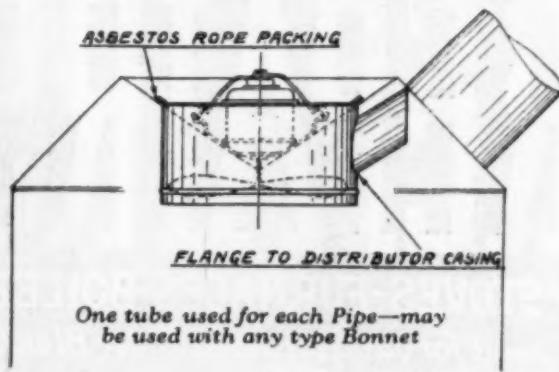
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Heat Distributor**



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The ROBINSON Heat Distributor is easily installed in any type bonnet.

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Write for prices and installation directions today.

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MASSILLON, OHIO**

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EASY to install; simply cut a round hole in smoke pipe and CLAMP on the TEELA check draft.

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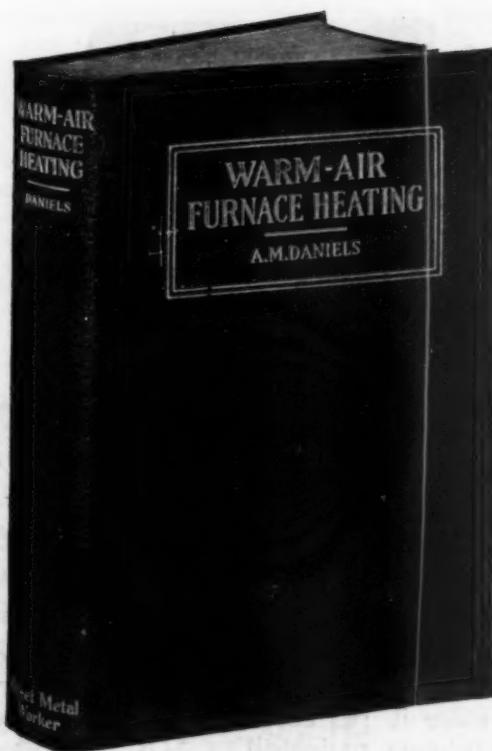
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Easy to remove when smoke pipe is worn out — loosen clamp, slide check off.

Cuts labor one-third—makes profit larger.

TEELA SHEET METAL CO., - - OSHKOSH, WIS.

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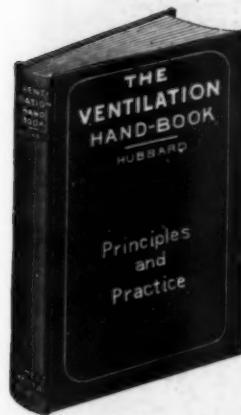
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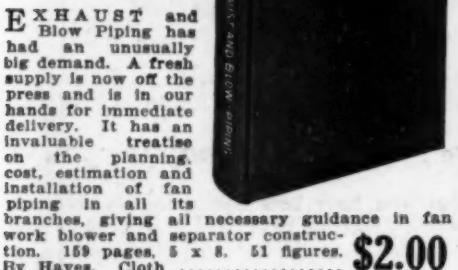


THE VENTILATION HAND-BOOK A PRACTICAL

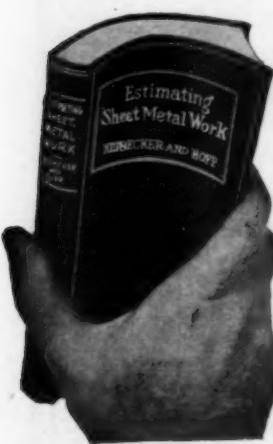
book designed to cover the principles and practice of ventilation as applied to furnace heating; ducts, flues and dampers for gravity heating; fans and fan work for ventilation and hot blast heating by means of a comprehensive series of questions, answers and very plain descriptions easy to understand. By Charles L. Hubbard.

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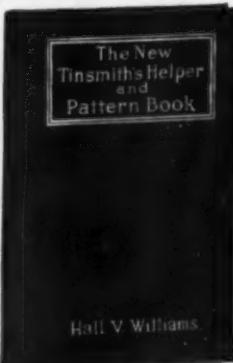
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Hall V. Williams.
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PROFESSOR A. J. MACK ON FARM VENTILATION

Sheet metal contractors doing business in rural communities are constantly coming into contact with a demand for the construction and installation of ventilating systems particularly adapted to the ventilation of farm buildings. This demand leads to considerable complexity on the part of the sheet metal contractor because of the multi-varied employments of ventilation in this type of work. A cattle housing requires one type of ventilation, while a hay mow may need an aeration system entirely different.

In order to set sheet metal contractors right on this subject of farm ventilation and to give them facts which they can use to advantage, AMERICAN ARTISAN has secured an exclusive series of articles on this subject from Professor A. J. Mack, Department of Mechanical Engineering, Kansas State Agricultural College, Manhattan, Kansas. The first of this series will appear in a near issue of AMERICAN ARTISAN. Watch for it.



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B RIGGS is a Standard Code man. He knows what Recirculating Warm Air Heating will do. The minute he gets a line on a big house, he's there with more selling reasons than a porcupine has quills—and they're just as much to the point!

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Patented, Dec. 15, 1925—No. 1,566,125

A UNIVERSAL MANDREL
WITH ADJUSTABLE HEAD,
FOR DOUBLE SEAMING
AND RIVETING
ON CURVES AND
SQUARE WORK



The HYRO UNIVERSAL HOLLOW BENCH MANDREL gives the sheet metal trade a truly universal bench mandrel with three different styles of heads that can be easily, quickly and rigidly locked to any required position. This unique combination allows the sheet metal worker to double seam, rivet or work practically every conceivable shape experienced in the sheet metal line.

This Tool can also be used in the same manner as the old conventional bench mandrel. The heads make very handy dolly bars. The tool measures 40 inches overall and weighs 53 pounds.

STANDARD HEADS



HEEL
SHAPE
No. M-1

FLAT IRON
SHAPE
No. M-2

HALF
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SHAPE
No. M-3

*This Time and Labor Saving Tool
Soon Pays for Itself
Over and Over Again*

HYRO SHUR-GRIP SOLDER IRON HANDLE

Patented, April 24, 1923—No. 1,453,082

*Screws On
and STAYS ON*

*Can't Split
Can't Come Off
Won't Burn—Stays Cool
Will Outlast Ten Ordinary Handles
Standardized by Shops where
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New York, N. Y.



American Artisan and Hardware Record



Vol. 94

CHICAGO, NOVEMBER 26, 1927

No. 22



Roof of Undertaking Establishment of Joseph McMahon-Coburn Company, New Orleans, Louisiana, Showing Skylight
Erected by the P. H. Cotton Metal Works. The Man in the "Specs" Is P. H. Cotton

"Dead Men Tell No Tales," But They DO BUY SHEET METAL

*Undertaking Establishment at New Orleans,
La., Roofed With Sheet Steel by P. H. Cotton*

By GEORGE J. DUERR

PRICE, it appears, has little or no influence in swinging the job where the sheet metal contractor has been careful at all times to sell himself to his customers on the merit of his workmanship and of the materials he uses.

Under such circumstances competition has a way of slinking out of sight like a cowardly dog with his tail between his legs. This is true in all sections of the country and in all instances where industry comes into direct contact with the

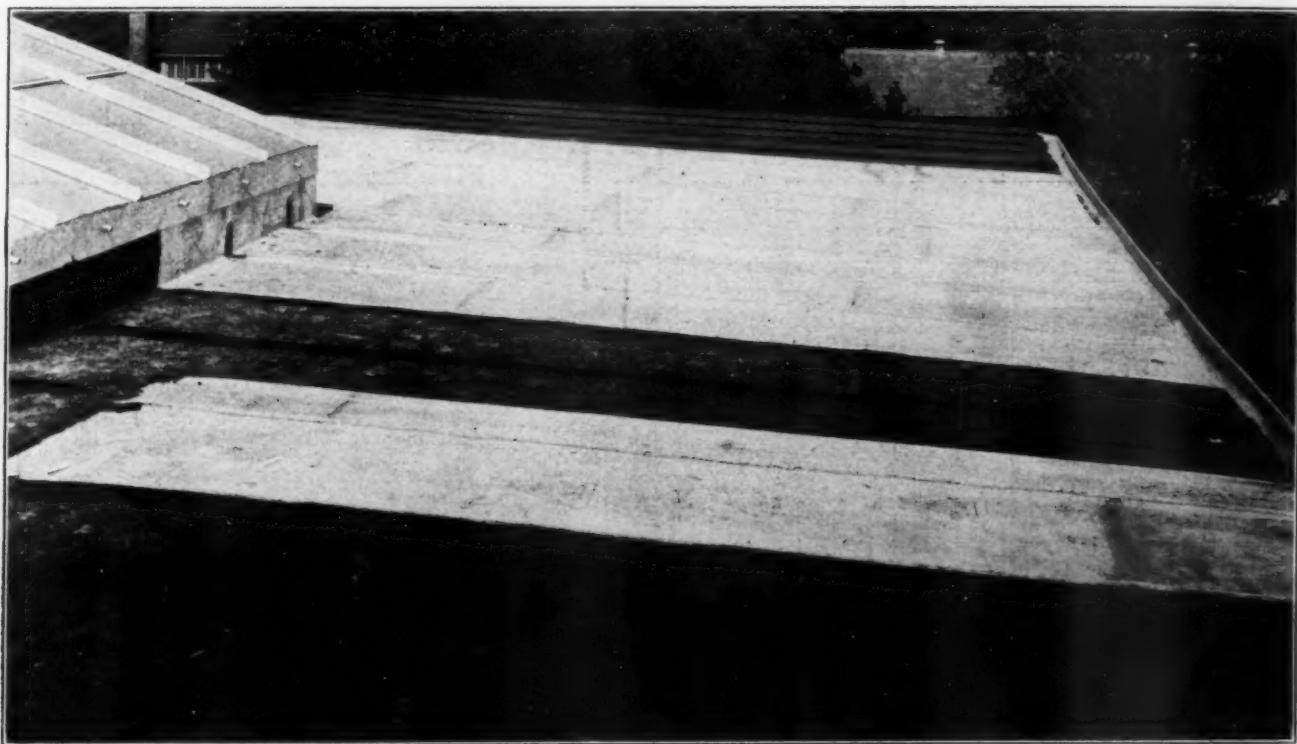
public. The only requisite is the establishment of confidence in the mind of the consumer by acts and not words.

An instance of how this works out is found in the experience of the P. H. Cotton Metal Works, 4628 Bienville Avenue, New Orleans, Louisiana. The accompanying photographs are those of a sheet metal roof repair job which the P. H. Cotton Metal Works recently completed on the building of the Joseph McMahon-Coburn Com-

pany, Ltd., New Orleans, undertakers and embalmers.

Here is an instance of where the owner was so thoroughly sold either on sheet metal itself or on the selling of Mr. Cotton that he came back for more after one sheet metal roof had come to need repairs.

It is not known whether Mr. Cotton put the original roof on or not. The chances are that he did not, but that he got himself into the good graces of the owner through some other work that he did.



Section of Roof Showing Repairs Made to Old Sheet Metal Roof and also a Section of the Skylight Erected by the P. H. Cotton Metal Works

The whole job came about, however, by the McMahon-Coburn Company wanting a skylight in the roof of their garage. This job gave Mr. Cotton the opportunity to examine the roof, and finding it in need of repairs, he went to the owner with his story, the result being, as the accompanying illustrations show, the acquisition of a much larger job than was originally called for.

Of course, selling a man who has once tried the material and found it wanting is a much harder proposition than selling a man who knows nothing about the materials at all. The former has every reason to be skeptical.

The only tactics that can be employed in a case of that kind are those which relate to the owner the true condition of the roof and the reason for its getting into that condition. If you have built up a confidence in the mind of that man in your honesty and workmanship, as Mr. Cotton did in this case, you are pretty sure of winning your point.

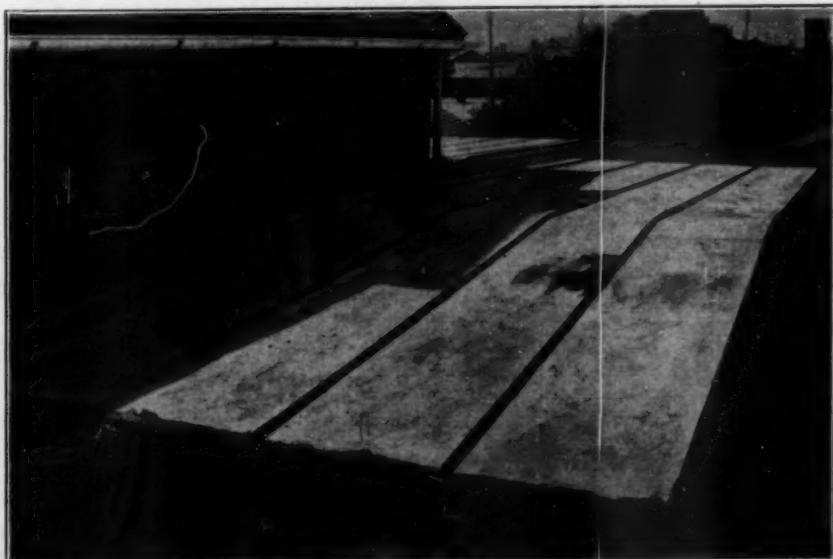
The skylight, as shown in one of the accompanying illustrations, is fourteen feet square of the double

pitched type, with louvre ventilated ends. It was laid out and put together in the P. H. Cotton Metal Works shop. Its construction required two bundles of 26-gauge steel 36x120 feet, and one bundle of 26-gauge, 36x120, galvanized iron. In addition to this there were used twenty-eight lights of 24x48x $\frac{1}{4}$ -inch wired fireproof glass, ten pounds of strictly half and half solder and seventy-five pounds of

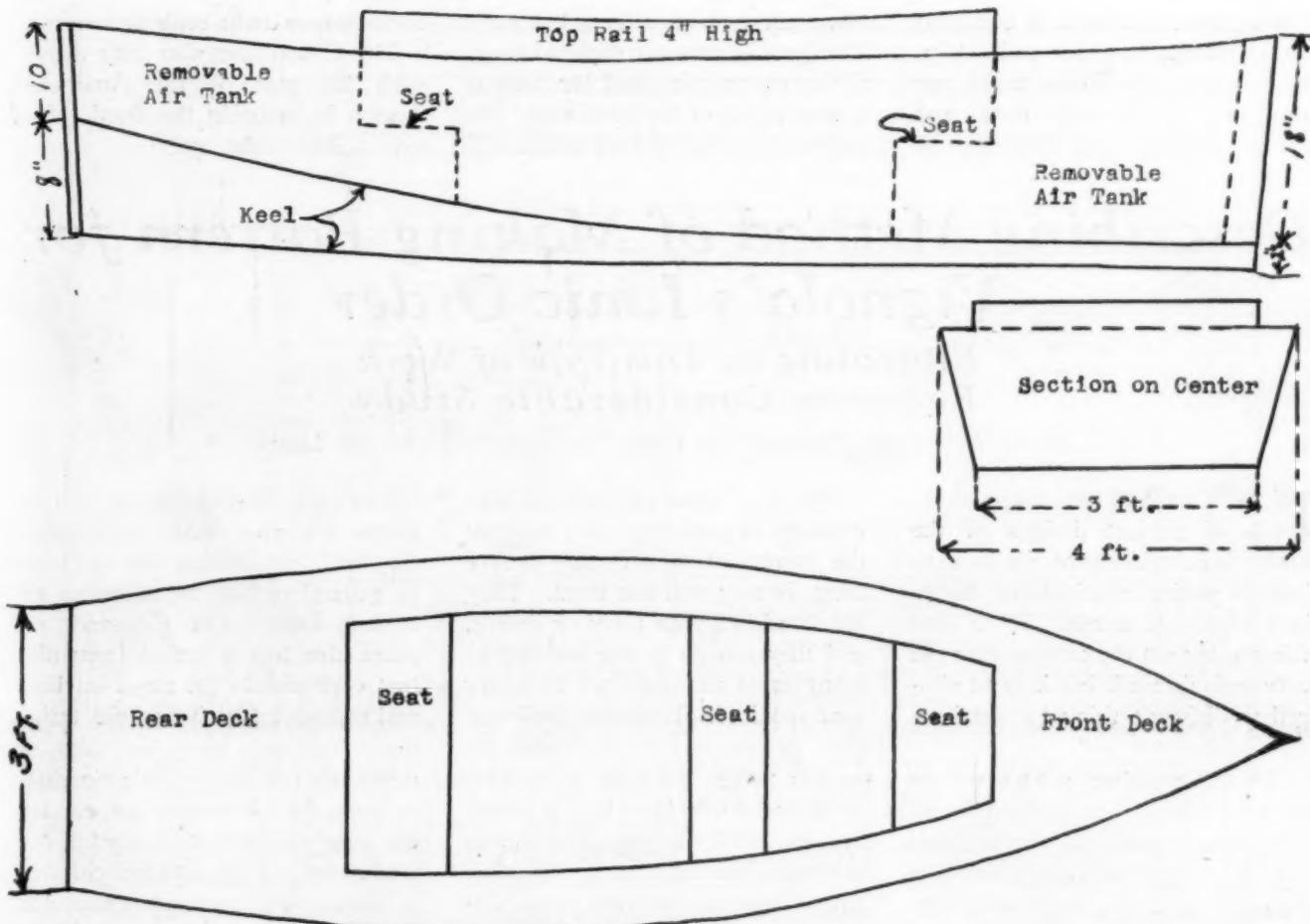
the best quality metal sash putty.

The labor item on the construction of the skylight amounted to the entire time of one man and one helper for five days, and it was made in sections and hoisted fifty feet to the roof of the building in sections and assembled there.

Another photograph shows two sections of roofing and new gutter erected in connection with the skylight. The new roof sections that



Still Another Section of the Roof and the Guttering and Downspouting Done by the P. H. Cotton Metal Works



Pattern of Metal Duck Hunting Boat Laid Out by P. H. Cotton During His Leisure Moments

were put in used 26-gauge, standing seam, double lock seamed, cleated and soldered. All standing seams were cleated every twelve inches, with two nails to each cleat. All cleats were two inches wide and made of steel.

As mentioned at the outset of the article, this job was secured by the company on the basis of past work.

The prices quoted were somewhat higher than other bids submitted, but the P. H. Cotton Metal Works was given the preference because of Mr. Cotton's ability to convince the owner that only the best materials and the best workmanship is put into each job that the company does.

Here is a concrete instance of

where competition did not enter into the transaction at all, in spite of the fact that competition tried to work the old lower price "gag."

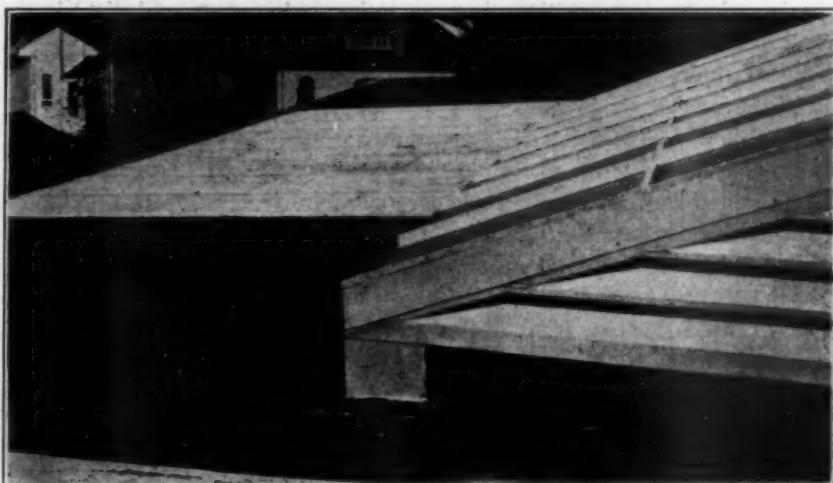
Men who say that they must cut prices in order to get business for their shops are only deluding themselves.

In addition to being a progressive sheet metal contractor, Mr. Cotton is also a duck hunting enthusiast. And for a bit of recreation he is now constructing a sheet metal duck hunting boat, a diagram of which is shown herewith.

The boat is sixteen feet four inches long, and four feet wide at the beam. Its frame is made of 1x2-inch cypress strips and the ribs are also of this material spaced eighteen inches on centers and nailed together with copper nails and clinched on the inside.

The frame is covered with 26-gauge steel. The seams are double locked and soldered. The cross beams are riveted and soldered.

A unique feature of this duck-



Section of the Skylight and Roof Repaired by the P. H. Cotton Metal Works

hunting boat is that it is equipped with air tanks in either end. (See side elevation.) These tanks are also made of 26-gauge metal and are so arranged that they can be

taken out and used as a life raft. The boat is almost completed now, all but the painting and Mr. Cotton is very proud of his handiwork. He intends to equip the boat with a 4½

horse power twin outboard motor.

Mr. Cotton was also very active with his post of the American Legion in assisting the flood refugees a short time ago.

Describing Method of Making Pattern for Vignola's Ionic Order

Estimating on This Type of Work Requires Considerable Study

By O. W. KOTHE, Principal St. Louis Technical Institute, St. Louis

IN DETERMINING these methods of perfect designs of the Orders of Architecture, we do so to impress perfect relations and shapes in tradesmen's minds. It is one thing to lay out the pattern after the cornice is detailed, but it is an altogether different thing to detail a cornice that sets well.

The designs we show are the basis of instruction received in all architectural and engineering universities. These are the perfect designs the students learn, and from them the professional world makes all such changes of adjustment and adaptability to suit materials, as sheet metal, stone, terra cotta, or cast iron. This latter adjustment is always an after consideration to work in with the design of structure, and the nature of the material. But these perfect examples we here show are used as a basis, and no matter how differently the members are arranged, the draftsman must carry these general principles in mind.

The matter of estimating cornices by the large masses of the trade would provoke merriment if it were not so serious. Even long established concerns are governed by the "hunch" more than by cold figures. Thousands of shop owners will look over a plan, take out their pencil, make pretense of writing—and about that time certain figures will filter into their mind, and they quote that as their estimate. That is all wrong—they are applying the hunch gamblers use when they are bidding on things over which they have no power.

But sheet metal men are not supposed to be gambling—they have all the known facts necessary before them, if they will use them. They are furnished with plans or details, and they can go to the building in many cases and measure up every foot required. They can work out their details, and so get within an inch or two of the girth it requires. Sheet metal men have been working at metal work for years, and still do not make an accounting of labor necessary to do different jobs. The facts are all there to be made use of, but most men do not see them; they do not want to know how to use them.

Most tradesmen want estimating, yes, and talk of it as desiring some cut and dried method like cranking an automobile engine. To my mind, estimating is the sum of all other business knowledge. A person cannot give a suitable price unless he knows all the factors that enter the estimate. I want to tell my readers that there is much more than just length and width of sheet iron and labor that enters an estimate. Very few of the smaller shops know what "Shop Policy" is—they haven't any and do not know how to organize a consistent policy by which to do business. This is in itself one of the great factors that controls prices, and yet very few know how it functions.

Men accustomed to scratch around on tin roofs, hang and clean gutters, etc., like to proclaim they do cornice and skylight work and all that sort of thing, but they never make any success of it.

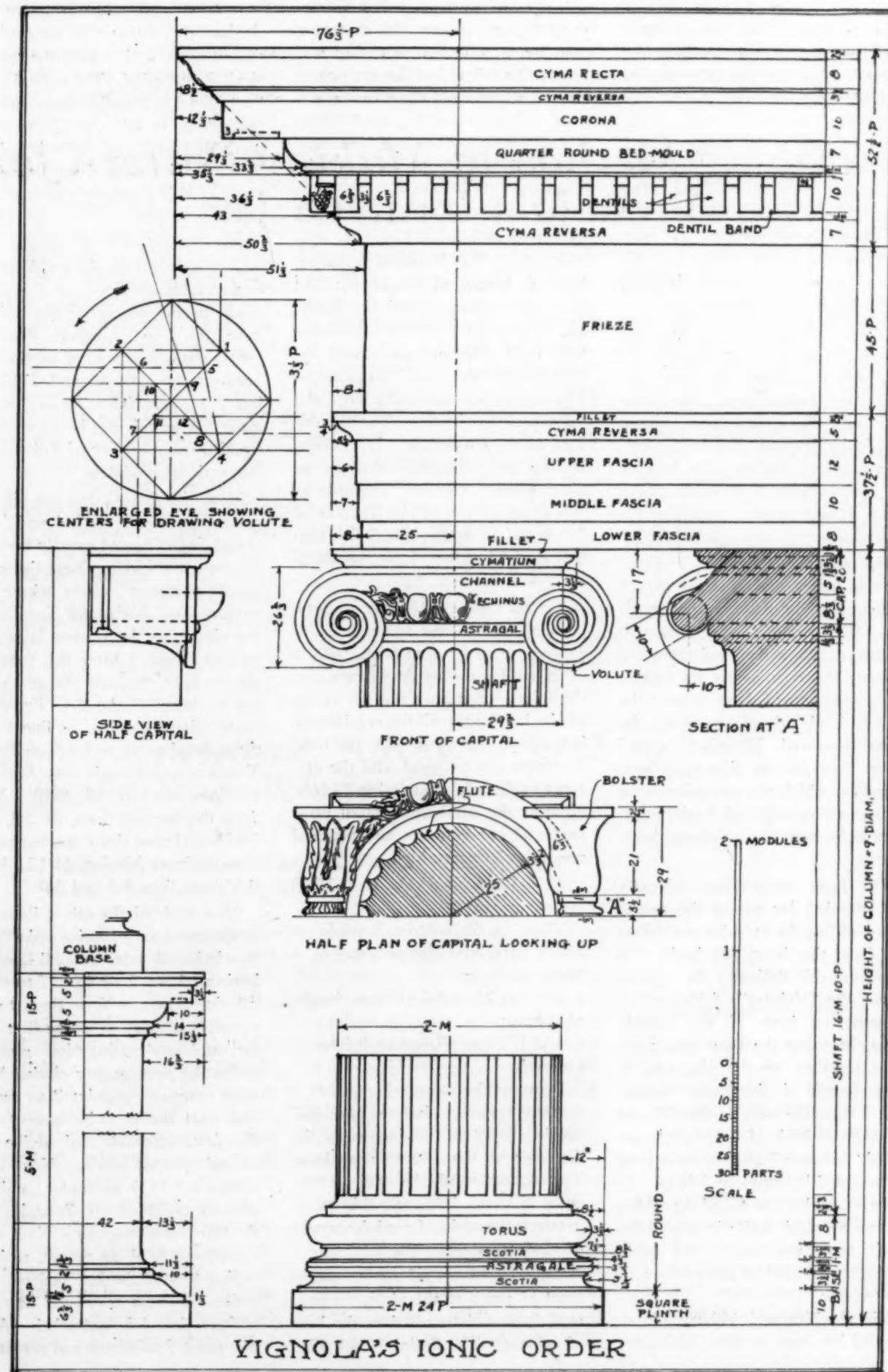
The old Greeks were a thrifty people for what little information they had. Knowledge was not near so general or far extended as we have it today. For thousands of years men had to travel from distant countries to the more intellectual centers to receive special training. It is only since less than 50 years ago now that a little tin shop in some far-off corner can receive the same technical advantages as the tradesmen in more favored cities.

The Greeks were at about 325 B. C. the favored nation of the world. They were the most successful and wealthy of all nations, like the United States is today, and they did things in a grandiose fashion for those days, just like we have the marvelous modern skyscrapers.

The word "Ionic" is derived from one of the principal divisions of the Hellenic people, called "Ionians." In historic times the term Ionian was applied to the inhabitants of Attica, where some believed the Ionians to have originated.

The earliest explicit Greek account of the Ionians is given in the 5th century B. C. by Herodotus, where the "Children of Son" originated in North Eastern Peloponnes. Later they migrated and go by the name Ionia. In ancient geography this has reference to a portion of the West coast of Asia Minor, adjoining the Aegean Seas. Here a narrow strip of land near the coast, which together with the adjacent islands was occupied by immigrant Greeks of the Ionic races.

But it was these folks who per-



fected the design of architecture known as Ionic. It is most likely they borrowed certain designs and features from other peoples and developed them into the Ionic order with some creations of their own. Purely Greek orders never use a pedestal, but have the column base set right on the stylobate. The pedestal is a Roman addition, and so wherever no pedestal is used we know the Greek orders are followed, but when a pedestal is used, the order is then Romanized.

So in drawing plate we show the Roman, Vignola design of Ionic order. On the Greek side there are really two distinct types, the Attic-Ionic and the Asiatic-Ionic, whose principal difference lies in the column base and cornice. The base of the Asiatic-Ionic type consists of a torus resting upon a double scotia which is carried by a square plinth.

The column is from 8 to 10 diameters in height and is scored by 24 semicircular flutes separated by fillets. The capital is the distinctive feature of the order, and there are several theories as to its origin. One of the best of these seems to be that it is the development of the conventionalized Egyptian lotus flower. In Assyria tiles have been found on which are primitive Ionic forms; no remains of Ionic buildings have been found there, however.

The Ionic capital was evidently not intended for use at the corner of a building, as its sides are different from the front and back. To overcome this difficulty the Greeks placed the "Volutes" of the corner columns on both of the outside faces, bringing the two corner volutes together on the diagonal, as in the temple of Ilissus near Athens. The pillow-like rolls on the sides of the capitals back of the volutes are called "bolusters" and are sometimes ornamented by flutes or foliage. In some examples are found a necking and an astrayal, while in others the shaft terminates under an ovolو moulding just below the cushion of the volutes.

The Architrave is either plain or divided into two or three plain sur-

faces, each projecting slightly beyond the one below. Its crowning member is a Cyma moulding and fillet. The frieze is a flat surface to receive sculpture. The Corona is a plain undercut member supported by a Cyma bed-moulding in the attic form and by a dentil course in the Asiatic.

The Roman Ionic order seems to have been borrowed from the Asiatic style. The Romans, however, lost the beauty of proportion and from that characterized the latter, and in its place overloaded the order with bold ornament and made the entablature heavy and unpleasant. The cornice was unusually large and supported by dentils. The mouldings were semicircular in section, lacking the refinement of those of the Greeks. The best example of this order is that of the Theatre of Marcellus at Rome, and it is from this that Vignola's Ionic seems to have been derived.

Let us assume we have a Bank building where Ionic columns are to support a super structure, with a lintel similar to our Architrave and the frieze continues up as the fascia of the building until the entablature is reached. Let us say we only need a column and pedestal, and the distance to the top of capital is 23 feet. Now as the entablature takes up 3 parts, so our columns and pedestal are only 16 parts high.

$$23 \times 12 \text{ divided by } 16 = 17.25 \text{ inches per part.}$$

Then, as the column is made up of 12 parts and the pedestal of 4 parts, we have

$$12 \times 17.25 = 207 \text{ inches height of column.}$$

$$4 \times 17.25 = 69 \text{ inches height of pedestal.}$$

Then, as the column is equal to 9 diameters in length, we have 207 divided by 9 = 23 inches as the diameter of the column near base. The module would be half of this, or 11½ inches long. To this measurement the scale of modules would be made as shown.

Now by means of the measurement of parts on the plate, the pedestal is first detailed, then the base of column. The fluting is not filled

in until the half plan is drawn for the base of column. In our case we do not show it, but only the top of shaft with capital. The capital with the volute is possibly the hardest portion to detail. There are two methods of making an Ionic volute. The one with parallel scrolls, as we show in this plate, or the one with tapering scrolls.

But toward left of capital and slightly above it we show a diagram, considerably enlarged, of the small circle in the center of the volute, called the "eye." Observe, this center of the eye is located on the line between the astrayal and Echinus, but 29¾ part from center line of shaft. Now this eye is described to equal a full diameter of 3⅓ part of our scale of modules.

Now, inside of this eye, in the enlarged view, a vertical and horizontal line is passed exactly through the center of circle. Next draw the square between points where the vertical and horizontal lines cross the circle, so the square is setting on one corner. After this pass 45-degree lines through the center of eye as lines 1-3 and 2-4. From the center divide one-half of line 1-3 in three equal parts as 1-5-9, and with T-square and triangle draw horizontal lines, as 1-2, 5-6, 9-10. Next drop the vertical lines, as 2-3, 6-7, 10-11, and then draw the horizontal lines again as 3-4, 7-8, 11-12. After this draw lines 4-5 and 6-9.

Now each of the above lines can be extended and thereby make quarter circles, as from vertical line 1 to horizontal line 2, or from 2 to vertical line 3, etc. Now then, to set compass to point 1, as the first center, and any radius for practice, strike the first quarter circle. Next reset compass to point 2 as center, and reset radius to be tangent with the first quadrant, and strike the second quarter circle. Next reset compasses to 3 as center, and the tangent point of arc 2, and strike the third quarter circle. Next reset compasses to 4 as center, and the radius to suit the last tangent, and strike arc from horizontal line 4 to oblique line 4-5 extended. After this point 5 as center and repeat the

process until the scroll runs into the eye.

The second or inner scroll line is described from the same centers, after giving the desired width for the top fillet. In practice this same diagram must be drawn inside of the eye of the elevation drawing. This requires fine lines and extreme accuracy. The fillet between the channel and cymatium will then govern the radius for describing the volute. The matter of filling in the egg and dart ornament over the zchimus is a free hand accomplishment, and must be filled in by eyesight and judgment.

Observe, the entablature is somewhat heavier than our former orders—that is, more members are used. Thus the Architrave in shop practice is called the "foot mould." It is made up of three fascia strips, having an offset of 1 part of the scale. The mould is a reverse ogee and a fillet member. Next comes the frieze, often called the panel, and above this we have the cornice proper.

The Cyma Reversa, or reverse ogee, forms a "bad mould" for the

dentil band, often called a "dentil course." Above the dentil band and just below the cornice planceer, this mould is called the bed mould, being the bed from which the cornice grows out. The planceer, or the flat space underneath the cornice, is often left bare, is also spaced off in inset panels, and sometimes electric light globes are placed in the panels to illuminate the building at night. By following measurements as directed the entire entablature is detailed as shown.

When this is detailed neatly with clean, sharp lines, a beautiful example is created. First, the draftsman should rough in his lines, very faintly, with a sharp, medium, hard, good lead pencil. Avoid dirty leads in the pencils—they cause more sorrow and embarrassment than what better ones cost. Then when the order is roughed in, and no erasing is necessary, then strengthen all outlines to make your work set out.

But merely looking at it will never achieve this distinction—it must be reproduced, so you put your whole thoughts, mind, eye and hand as well as the best of your soul into it.

photographs and descriptions will be judged at the convention and announcement of the prize winners will also be made at that time.

This competition is open to any and all sheet metal contractors, warm air furnace installers or roofing contractors.

The Travelers' Auxiliary reserves the right to submit for publication in the various trade papers any or all of the photographs and descriptions submitted.

This is indeed a valuable form of co-operation for the industries of Illinois. It is probable that no single improvement could be wrought in the case of many sheet metal and furnace shops than that covered by making their appearance more attractive. An interest in window display will compel improvement in that direction. Every contractor and furnace dealer who will take the small trouble entailed by entering into this contest—whether among the prize winners or not—will find that his effort will be repaid fully by the increased interest the public will show in his direction.

Illinois Travellers' Auxiliary Will Again Stage Window Display Competition

Photographs Must Be in Office of Secretary Not Later Than One Week Before Convention

THE Travelers' Auxiliary to the Sheet Metal Contractors' Association of Illinois is again sponsoring a window display contest, with cash prizes totaling \$100.

Encouraged by the keenness of the 1927 contest and the interest shown, the Travelers' Auxiliary is again prompted to make a similar offer for 1928, embodying six prizes—\$40, \$25, \$15, \$10, and two of \$5 each.

The following rules governing the contest are announced with the annual roster of the auxiliary:

You may enter as many photographs and descriptions as you desire. Each photograph must be accompanied by descriptions of how

the window displays were arranged and the materials used. The description is important and must be adequate. These photographs and descriptions must reach the office of the Auxiliary secretary, Etta Cohn, AMERICAN ARTISAN, 620 South Michigan avenue, Chicago, Illinois, not later than one week before the opening of the 1928 Illinois Convention.

Each photograph and description must be signed by a fictitious name or device and the same name or device must be put in a sealed envelope containing the real name and address of the contestant.

This sealed envelope must be enclosed with the photograph. The

New Pistol Grip Saw Frame Makes Debut

A new hack saw frame known as the Pistol Grip frame has made its appearance. It is so shaped as to give a firm, comfortable grip, eliminating hand-cramp and insuring complete control, thereby reducing the breaking of blades to a mini-



Showing the Saw Frame With Blade

mum. The handle is of special composition vulcanized rubber.

All parts are held together when the blade is not in place.

The blade is tightened by means of a wing nut which is located in back, out of the way, and may be faced in four directions.

This new frame is being marketed by the Consolidated Tool Works, Inc., 136 West 52nd St., New York City.

Annual Expenditures in U. S. for Buildings Now Reaching SEVEN BILLION Dollars

Rate Not Likely to Diminish But Rather It Will INCREASE During Next 5 Years

By FRANKLIN HOBBS*

IN any discussion of the building and construction activities of the United States, it first becomes necessary to determine the total volume of such operations over a period of years. Even though we witness the building activities of our own and other cities, it is difficult for us to sense just what such current construction means, and just what its relation may be to the ultimate rebuilding of the entire country.

Using calculations of the U. S. Bureau of the Census, of the Federal Trade Commission, and of the leading economic and statistical authorities, we find that, at the present rate of building construction, we will rebuild the entire United States in a little more than a decade. Based upon the physical volume of Construction at this time of writing, every building in the United States will be replaced or duplicated in dollar value within a period of ten to twelve years.

All Buildings Duplicated in Ten Years

With this fact before us, it is easy to understand why a building slump creates such widespread unemployment and business lethargy. Building is the most important thing we do. Land we have, and to that we cannot add. But with land alone, we would remain as primitive as the red men we found here. Building is the evidence of our civilization. Building is the visible evidence of our education in the sciences and the arts, all of which are expressed in buildings, and in their equipment and decoration.

The story of a people is written in its buildings. Most of what we

know of those races which have gone before us has been determined through the construction they left behind.

Building Is the Keynote Industry

Quite naturally, in any calculation of business activities, we take building and construction into account. Quite frequently, we fail to give to building operations their proper place in the calculation of the total of business activities. Building and construction represent the one great fundamental of civilized life. Foods grew wild and our ancestors had them for the taking. Skins were removed from animals and used for clothing. Logs, barks, and leaves were used in a crude form for housing purposes. Before we went far, we found the necessity for permanent and substantial buildings, and the earliest races of which we have knowledge builded of stone, and of dried clay.

We should not lightly pass over a material increase or a considerable decline in building operations. It is seldom that a building is erected until it is needed. The demand for space makes it possible to finance the erection of the building. It is the demand of traffic which extends the railroad lines, builds the bridges, and creates new freight and passenger terminals, as it is the demand of rubber-tired traffic which causes the building of the highways.

All Buildings Worth Seventy Billions

At the beginning of 1923, all of the buildings in the United States were valued at seventy billion dollars and, in the year 1924, we have dependable records of building operations amounting to nearly six billion dollars. It would seem con-

servative to estimate the construction not included in this total at a billion dollars more, making a total value for our building and construction during the year 1924 of seven billion dollars. This would replace, in dollar value, one-tenth of all the buildings in the United States. Since 1924, we have not only repeated that operation, but have been adding to it annually. In 1925, operations of record exceeded six billion dollars by two hundred million dollars and, in 1926, the six-billion-dollar mark was exceeded by six hundred million dollars.

We started 1923 with buildings valued at seventy billion dollars. Since that time and up to this present date, building and construction have exceeded thirty-five billion dollars. This means that we have rebuilt one-half of the United States in five years.

Present Minimum Triples Former Maximum

Although conditions at this time are not comparable with the pre-War period, it is enlightening to note that building activities during any month for more than two years have exceeded the best three-month record of any pre-War year. Average monthly building operations for the elapsed portion of 1927 are exactly one-half of total building operations for 1913, the last full pre-War year.

In making calculations for the future of building and construction, it becomes necessary to classify building and other construction activities in order to determine what classes of materials will be in greatest demand and what percentage of buildings will be used for housing, for offices, for churches, for theaters, for schools, for manufacturing, for government, and for every other purpose.

*Article on the Rebuilding of the United States by Franklyn Hobbs, business analyst, LaSalle Extension University, writing in the Business Bulletin of LaSalle Extension University.

Nearly Half of Building Is for Housing

The past history of building indicates that residential building amounts to three times the commercial building, three times public works and public utilities, four times industrial building, and three times all other, or miscellaneous, building. There have been years when residential building represented almost one-half of all building. In fact, for a long period of years residential building has represented from 40 per cent to 50 per cent of the total of building operations. During the years 1925 and 1926 and the elapsed portion of 1927 residential building has represented 43 per cent of all building operations.

The result of this activity, which was encouraged through the post-War housing shortage, is an overbuilt condition in a few cities and in certain residential sections and suburbs of other cities. This overbuilt condition is far from general, applying to no more than five cities of more than 100,000 population and to not more than fifteen of the two hundred and fifty principal cities in the country.

Some Classes of Building Overdone

Manufacturing capacity provided during the War period left us in 1919 with manufacturing space which, it was generally believed, would not be needed for a decade, at least. But the changes in living conditions, which followed the War, the increased earnings of the people, and the development of export business took up the slack in manufacturing space, and we have built half as much manufacturing space since the War as we possessed on the day the World War began—and we are still adding to our manufacturing capacity.

If there is any class of commercial building which has been overdone in a number of the principal cities, it is probably in the group known as office buildings. There does exist an excess of office space in about one-fourth of the large cities, but present and prospective

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commercial activities indicate that this space will soon be in demand and a further program of office-building construction will be necessary. In some classes of structures—and office buildings belong to one of these classes—it is necessary that we anticipate our needs and provide this year for the demands of next year and the year after.

Theater building has been overdone in almost every community of size. Not that there was no demand for the new theater, but the new and modern structure draws the attractions and the patronage while the older structures, though far from obsolete, suffer a decrease in earning power, or must be closed altogether.

Educational Demand Continuous

One class of construction which could hardly be overdone is that of educational buildings. Such a building program as has been carried through by the colleges and common schools during the past ten years has been beyond the most optimistic forecasts of architects, builders, and educators.

Within ten years we have built more educational space than existed ten years ago. We have almost rebuilt the schools of the United States since the Armistice was signed and, when present building programs have been completed, we will have duplicated in practically ten years' time, the educational space which we had at the close of the World War. We have not only erected these buildings, but we have introduced into them such art in architecture as America has never before seen.

Building Shortage Still Exists

The building of public works and public utilities must go on. The Federal Government lacks space for the economical handling of its affairs in almost every important city. No doubt, a considerable portion of the usual postal deficit can be overcome through the provision of better and more convenient buildings for the handling of mail. Most

of the governments of the forty-eight states are reasonably well-equipped, although in at least eight states additional space must be immediately provided.

Great Projects for the Future

With the exception of a very few, the one hundred principal cities of the country are suffering from lack of space for civic activities. We do not refer to schools, which are included above with educational buildings, but in this group we would mention police and fire stations, jails, public hospitals, and almshouses. In the main, library facilities are ample, but little provision has been made for the future growth which will bring added demand to the libraries.

The future building and construction program must give particular attention to four major groups, in each of which a tremendous shortage has existed for some time, and still exists. It may be impossible to keep up with the demand for more motor highways, but this form of construction must continue to increase year after year.

Warehouses Needed for Surpluses

The steam railroads can hardly go on increasing their freight tonnage without making material additions to trackage and to terminals. Many large projects of this nature are in contemplation, several are provided for, and a few are actually under way. In one city alone, the next five years will witness expenditures on railroad terminals and associated facilities amounting to several hundred million dollars.

Probably the most important need of the country is for more warehouse space. This space must needs be provided where it can take care of the primary products of agriculture. The easiest way to prevent surpluses from breaking markets is to keep the surpluses as near to the point of production as possible.

Brazil holds its coffee in the hills and allows it to come to São Paulo only as the market demands it. Were it possible for the small and average American farmer to hold

his products in public warehouses until keen demand provided an active market, he would soon be on a par with other manufacturers. With his surplus in public storage, he would have a bankable collateral in the form of official warehouse receipts, with which he could finance himself toward the next crop.

No Decline in Demand for Materials

The immediate future may see some decline in residential building; there may be more than a momentary hesitation in the construction of office buildings; theater construction may be less; and we may not be called upon to add so greatly to our manufacturing capacity. All of this may come about, but it will not necessarily mean the slightest diminution in the demand for steel, glass, brick, stone, terra cotta, sand, gravel, lime, lumber, or any other material going into building construction.

Whatever slackening may occur in the erection of certain kinds of buildings will be doubly offset by the construction already referred to and by that other tremendous building project which is just now occupying the attention of the majority of the country's greatest engineers. It is hardly necessary to mention the development of waterways, the building of dams and locks, and the provision of bridges and dockage.

In this composite project, we have a potential demand for the expenditure of billions of dollars. The discussion of flood control in the Mississippi Valley has brought out estimates that in this section an expenditure of perhaps a billion dollars is demanded. And this is only one branch of the whole project, which includes the development of the midcontinent waterways and the opening of a ship canal from the Great Lakes to the Atlantic.

The estimated expenditures for building and construction operations have been running at six or seven billion dollars annually for several years. It is altogether unlikely that it will diminish. It is more

likely that the total cost of all such improvements during the next five years will exceed those of the five years just now ending.

World Zinc Conditions Show Little Change from Last Month

The statistical position of zinc in Europe shows little change, and offers from the Continent are kept within bounds of the present capacity of the market to absorb, so that prices have fluctuated within narrow limits. At one time, thanks mainly to a demand for high-grade and a shortage of supplies which caused a fairly substantial premium to be paid for spot metal, the quotation for G. O. B. jumped to £27 11s 3d, but there was really nothing to justify this.

The continued lightness of offerings of metal is somewhat of a surprise, but none the less a source of much gratification. Certainly the Belgian output was slightly lower in September and it is anticipated that the October figure will show a further small cut, but elsewhere there is no sign of any falling away, though after the turn of the year the rationalization of some of the Upper Silesian works may cause some temporary curtailment in output there.

Apropos of Upper Silesia, it is officially reported that the results of tests on electrolytic production of zinc are very satisfactory and that the resultant metal will compare favorably with any other high grade zinc.

So far there have been one or two rather unexpected bursts of buying to aid the position; for instance, first Russia and then the Central European States have taken up quite good tonnages and so relieved the situation, but a continuance of these rather unusual features can hardly be reckoned on, and the salient point seems to be that the demand for zinc sheets is showing definite signs of slackening; as the galvanizing trade is certainly not making up the deficiency, the obvious outcome is rather more metal available for the open market

and a corresponding easing of values.

Probably the weakest factor in the outlook just now is the American position, and just what to make of it is puzzling a good many interests over here. Of course, there is no need to worry as to the possibility of any material tonnage of zinc being offered in Europe. Except in abnormal times there can hardly be any great trade in Prime Western, and of late it would appear that producers of high-grade on your side are not finding the European figure attractive, as the agencies here are refraining from offering, but the effect of the continuous sagging in the St. Louis quotation is the reverse of cheerful.

World stocks of zinc as at 1st November are estimated as follows:

	Metric Tons
United States.....	32,930
Canada	2,800
Australia (including shipments afloat)	2,500
Germany-Poland	7,200
Belgium	4,100
France	1,500
Great Britain.....	1,600
Scandinavia	200
Far East.....	600
Elsewhere	1,500
Total	54,930

Fort Wayne, Indiana, Meeting Date Advanced to December 8th

In the issue of AMERICAN ARTISAN for November 19th there appeared an announcement of the meeting of the Fort Wayne, Indiana, sheet metal contractors scheduled for December 1st.

Because of the fact that the mid-year meeting of the National Warm Air Heating and Ventilating Association at Urbana also falls on that date, the Fort Wayne meeting date has been advanced to December 8th.

Charles E. Tharp, secretary of the Fort Wayne organization, has charge of the arrangements. The meeting is to be a "pep" restorer and everyone interested is invited to attend.

Acid Bottle Carelessly Placed Ruins Sheet Metal Roof

By L. S. BONBRAKE

TIN roofing, or steel sheets coated with amalgamate, principally of lead (called terne plate), has had to stand the gaff for all the other sheet metals in roofing, from the fact that from the earlier days the preponderance of use in sheet metal roofing has been with tin. As a general proposition, any unusual catastrophe occurring to another character of metal, was reckoned on as tin being responsible by a general class of people not acquainted with sheet metal or its vocation.

Permanency and Endurance the Big Factor Now

During these later days of enlightenment, the mass of intelligent citizens are giving more heed to the superabundance of good information appearing on this subject in many popular journals, which is giving them more and more a thorough comprehension of the subject which leads them through the whole category. We find they are coming back to the days when tin roofing was looked up to, as zinc and copper roofing are now.

Permanency and endurance is looked after now, rather than price. Observation shows us almost the

great amount of worthy competition surrounding the tin roofer. Carefulness in every move in the operation is necessary, and a continued feeling of an interest in the work must exist—a feeling of pride in the work. Skill should be displayed in the laying of that roof, rather than speed.

Usually it will be discovered that a roof is as good as the mechanic is good who laid it. So long as there are men who attempt to prepare the tin and apply it to a roof by any method where a stop-watch is involved, just so long will there be a handicap on tin roofing. It is time for the builder and contractor to wake up to the importance of this. The roofer of unusual speed in his roofing generally uses a big notch, or notches of varigated sizes, leaves nail heads exposed on the roof, uses few cleats, except when watched, skims the solder over the seams, always has loose anchorage with its accompanying rattle, bends his cleats with his fingers, leaves broken seams untouched and buckles unnoticed, cuts prices, and trusts to his speed to bring him a profit. Very much unlike a case with which I am

The roofers were from the county seat, New Philadelphia. In soldering the flashing around obstructions, chimneys, etc., an acid bottle was fastened to the charcoal fire-pot. In moving the fire-pot around, the acid would flop out on the roof, annoy-



Figure 2

ing the roofer. He then unfastened it and set it out upon the roof where it was kicked over several times and ran down the roof strips into the gutter. Never wiped out or any effort made to eliminate its destructive work, it is needless to say that in a very short time that roof was ruined beyond recovery.

The farmer was very much discouraged, yet, having confidence in a young tinner who was fast building up a record for square dealing, the farmer approached the young man on the subject of roofing and invited him to the house. After seeing the roof, the tinner told the farmer his trouble was all uncalled for, and with a plain, clear explanation informed the farmer that while it would be useless to try to save any of the old roof, he would lay him a new tin roof and give him a written guarantee for twenty-five years as to its endurance without leakage for that length of time. If painted as directed, and it suffered no unavoidable accidents. The tin-

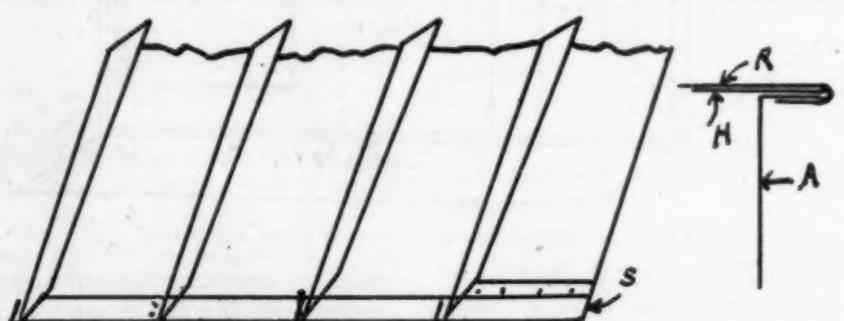


Figure 1—Eave Finish. R—Roof; H—Heavy Iron Strip; A—Angle Strip; S—3-Inch Iron Strip

same display of eagerness to finish up a job of tin roofing, or any other kind of sheet metal roofing, in a day, whether it be three squares or double that amount, as was displayed half a century ago.

What is wanted today is execution that will stand up under the

acquainted with in Tuscarawas county, Ohio.

How Careless Contractor Ruined Roof

A farmer built a brick mansion on his place and had it covered with tin roofing, having a box gutter at the bottom, of the same material.

ner laid the roof in 1885, and it is still giving good service, and as far as looks indicate, it will probably more than double its guarantee.

However, the above is a warning for any tinner to steer clear of a metal roof with a bottle of muriatic acid or murate of zinc.

Tin is as flexible as steel, the only difference is in the gauge. As terne plate is leaded steel, which is a coating for protection of the raw metal, you will certainly know or understand the affinity, there is no more need for expansion provision in tin roofing than for steel and neither one requires an extra provision than is found in the standing seam, the eave and the comb finish. Extra give and take will be found in the gable end water guard, which in itself is a clever and easily made device.

How Gable End Finish Is Formed

The gable end finish is indicated by Fig. 2, and is formed by first drawing the roof strip, top side up, to near the gable, and tonging from the gable edge, 3-inch back upon itself, flat. After which tong forward from the end of the hem just formed 2 inches over the fold first made, flat, after which move the roof strip over to the extreme edge of the gable, so as to allow the 1-inch nailing edge of the tin a free swing downward, without intercepting or coming into contact with the sheeting.

An expanding joint will also prevent water seeping over the gable moulding which streaks and mars the painting, and is thus avoided when the fold on top of the gable strip has been tonged to a perpendicular. Knowing the few movements in this formation, you can figure height desired for the guard.

If $\frac{1}{2}$ -inch, make the first hem 2-inch instead of 3-inch. The eave can be finished over a 3-inch strip of heavier metal, 24 or 26 gauge, nailed along the entire length of the two of \$40 per square, the inch over the eave line, as wanted.

Underneath this extension an angle strip is nailed over the eave board's edge, as an apron, with the angle

laying flat against the heavier iron extension. When the roofing strips are laid one by one a hem is formed on the eave end of each, to engage the iron extension and the angle strip, which will form an expanding joint for taking care of expansion and contraction at the eave, as shown by Fig. 1.

Showing Formation of Double Seam

Fig. 3 illustrates the formation of a double seamed standing seam for a tin roof or is used in laying a tin roof. As stated heretofore, we know from an extensive research that suction and vibration have done more harm to tin roofing than any lack of contraction and expansion provision; in fact, tin roofing needs nothing extra in its formation construction as a provision, but does need an interest and care in the work that will do it well, and a knowledge of knowing how.

Observe how square the formations are and the close-up to the corner bend, manner in which the cleats are nailed. This assures safety from excessive suction and vibration, as the cleats are between the seam flanges and have a straight pull on the seam, which gives the

The single fold comb finish, Fig. 4, has been described and illustrated in the AMERICAN ARTISAN in previous issues, hence we will not repeat, but submit a small drawing of the finished comb, which is self-

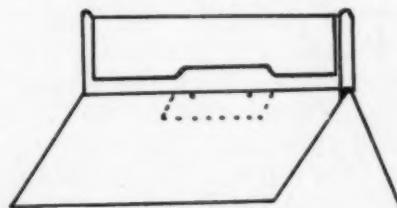


Figure 4—Finished Comb

explanatory. We advocate this comb finish as it takes much less work to make it on an undesirable portion of the roof for working conveniently. The comb is at the apex of the roof, and no substance of a damaging nature will work up under a single fold at that location.

Many Metal Roofing Jobs to Be Had

Tin is next to steel in cost per square as we note; quoted it is \$7 per square higher in price than steel. Basing cost on years of service and the several vital protections involved, a tin roof is the lowest priced roof of all the sheet metals, but it takes a real mechanic to get

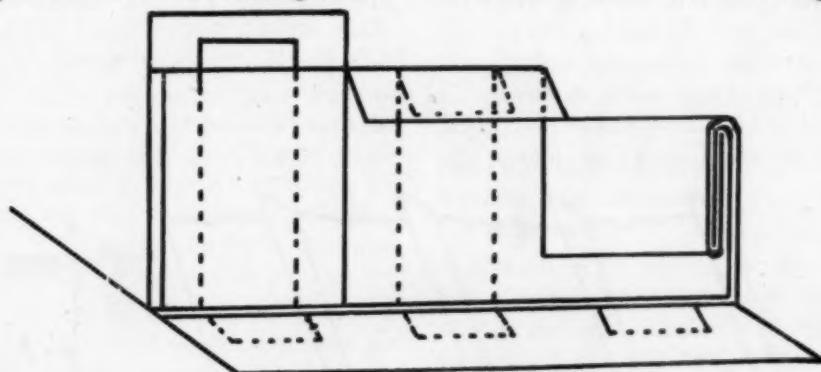


Figure 3—Double Seamed Standing Seam Formation

seam no chance to be pulled up off the sheeting, there is small chance for a start in disintegration, for that get underneath the roofing strip it will work havoc with the whole roof, stripping the sheeting clean of metal, hence I will dwell on this is where suction and vibration lead.

When the wind finds a way to point. Keep the cleat flat against the flange, and nail close up in the cleat corner or bend, and space the cleats not more than one foot apart.

this long service. A sheet metal roofer, with life and activity, in a rural town will soon learn of all the old wooden roofs in his neighborhood and for miles around. He will see them, as he passes on his way contracting metal roofing.

It will not be a loss of time to stop at where he sees an old wooden shingle roof in a fast decline. If he has not the time to wait to see the farmer, he can casually ask the farmer's wife if her hus-

band has talked of re-roofing his barn, thus starting the subject, and even if she says "No," he can truthfully drop a remark or two about the hardships of a country fire and the absolute impossibility of putting it out when it has a good start, or tell of the danger of fire from lightning, with any other roof than one of sheet metal, and tell of the perfect safety when roofed with tin. No need to fear his talk will not reach the farmer. He will be ready to talk business to you next time he comes to town, more than likely.

Tells How He Kept Posted on New Jobs

While living in a rural town in Ohio, and in the metal roofing business, I made it a point to see every carpenter and stone mason (for foundations) in the surrounding country, and had an arrangement with them by which I was posted as to every new building erected. Once well started in a certain locality, your prestige will be hard to down. However, it must be remembered that nothing but absolute truth and square dealing will pass muster in a rural community, otherwise word will get around the whole neighborhood, quicker than telegraphy, of the whole affair—with a plenty added.

As a general rule, we always found the Ohio farmer a pleasant man to do business with, hospitable, courteous. It is a very easy matter to say some of the higher priced metal materials need no painting, and tin roofing does. Why is not the song continued by saying, "But there is a difference in the price of eave and extending from $\frac{1}{2}$ to $\frac{3}{4}$ mon interest of which will more than give the tin roof all the painting repair, if any, needed in several generations." Taking all incidentals into consideration, a tin roof is the cheapest and best ever devised by man.

No Advantage Gained in Evasion

It will work no advantage to tin roofing to say it needs little or no painting. A well-informed man will tell you tin roofing does need a general program of painting to achieve its quota of years in longevity. The

amount of painting required certainly depends a great deal on its location and the amount of lead coating it carries. During the 80's we used, very near exclusively, a plate from J. M. Osborn, Cleveland, O. This plate was excellent, but carried only 15 lbs. of lead coating to the box of 112 sheets, 20x28.

With due care to the matter of painting, some of the roofs are still giving good service. For more special work we used Scott's extra coated, N. & G. Taylor's old style, either heavily coated; their endurance was assured with less painting. In the same cycle of time mentioned above, 112 sheets, 20x28, I. C. terne plate, were sold for from \$10.50 to \$11 per box and laid on the roof at the usual price of \$6.50 per square, although we know of a barn covered with 15-lb. coating at \$5.50 per square. We see the same grade quoted today at \$16.55 per box.

One of the nicest, also most vital, features in tin roofing is the absolute safety from fire from lightning when well grounded. Actual experience has proved to me time and again 'tis not merely a talking point. We know as a certainty 'tis the truth. Eaves-troughs with their connecting conductors can be mentioned as a good lightning conductor. If the shoe is elevated from the ground to connect with a rain barrel, attach a rod under the shoe and thoroughly ground the opposite end for guaranteed safety.

Board of Directors Michigan Sheet Metal Men Will Meet in Lansing

A combined meeting of the Board of Directors and the Trade Extension Board of the Michigan Sheet Metal & Roofing Contractors' Association will be held in Lansing, November 29th and 30th, at the Olds Hotel. The hours for the starting of the meetings will be as follows: Tuesday evening, November 29th, 8:00 p. m.; Wednesday, morning session, 9:00 a. m., afternoon session 1:30 p. m.

The Tuesday evening session will be given over to the discussion of

the advisability of employing a competent auditing firm to install proper bookkeeping systems for the members of our organization. For the past several months your officers have been investigating the possibilities of this project and will be prepared to give some very interesting information concerning it. Representatives of a nationally known auditing firm will be present to discuss the subject. If this project can be successfully put across it will undoubtedly prove to be one of the most constructive steps ever attempted by the association.

Another very important subject which will be decided upon at the Wednesday morning session is the Standard Built-up Roofing Specifications. The committee in charge has worked faithfully with the result that a complete set of specifications have been drawn up. They have already been presented to a committee of Architects, representing the Michigan Society and the Michigan Chapter of the American Institute of Architects. The architects have returned them to the committee for further consideration, especially concerning the guarantee feature.

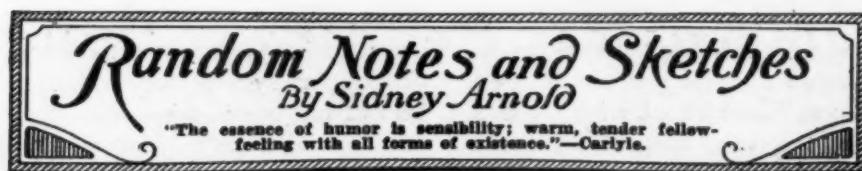
Bill Busch, chairman of the Michigan Standard Plastic Cement Committee, has been securing samples and information on cement and will present this information.

There are many other subjects of importance and all Board members are therefore requested to attend. Any other members interested in attending these sessions will be welcome.

A series of articles on Farm Ventilation has been prepared exclusively for AMERICAN ARTISAN by Professor A. J. Mack, Department of Mechanical Engineering, Kansas State Agricultural College, Manhattan, Kansas.

This series will treat all types of ventilating devices used in farm ventilation with which the sheet metal contractor comes in contact. Watch for the first of these articles.

Also the time is drawing near for the appearance of our 34th Warm Air Furnace Annual.

**Save the Soap**

W. H. Young, Behler-Young Company: What is the "Order of the Bath?"

Street Urchin: Pa first, then ma, then us kids, and then the hired girl.

* * *

No Spectator

They were newly wedded and not in the best of circumstances. Said Art Glessner, Hart & Cooley: "If things don't go better with us, darling, I suppose your father won't see us starve."

"No, poor dear," replied the young wife, "his eyesight gets worse every day."

* * *

He Was Sharp

An old man heard of a famous surgeon who could restore youth by performing a gland operation.

Going to the physician, the old man said:

"Could you make me seventeen years old?"

"Certainly I can," the surgeon responded, and the operation was performed.

Several months later the doctor sent a bill.

"Nothing doing," the patient responded. "I am under age and you cannot sue me, and if you say I am not under age, I'll sue you for fraud."

* * *

Foolish Question

They tell me that in his younger days Harry Van Bayse, American Furnace Company, was a fur salesman, his ambition being to emulate the great Astor in his fur trapping and trading enterprises. The reason for his change of affection from furs to furnaces, however, is found in the following story:

A young lady entered a fur store where Harry worked as one of the politest of polite salesmen.

"I want to get a muff," she said.

"Yes'm," said Harry. "What fur?"

The young lady looked surprised.

"Why," she said, "to keep my hands warm, of course."

* * *

"I shall die," throbbed the suitor, "unless you consent to marry me."

"I'm sorry," said the maiden kindly but firmly, "but I will not marry you."

So the fellow went out West, and after sixty-two years three months and a day became suddenly ill and died.

* * *

"There are just two things that break up most of the happy homes nowadays," Ray Schweinfurth, Mt. Vernon Furnace Company.

"What are they?"

"Woman's love for dry goods and man's love for wet goods."

* * *

Head of the house, being Lew A. Denoyer, Ottawa, in angry tones: "Who told you to put that paper on the wall?"

Decorator—"Your wife, sir."

"Pretty, isn't it?"

* * *

The Knight of the Grip was an earnest worker, selling loose-leaf ledgers and filing systems.

The sheet metal man (I can't mention his name) was a cheerful, happy-go-lucky individual whose bookkeeping methods were slack, to say the least. The place was strewn with stray invoices, unopened letters, and unopened accounts.

The salesman urged upon the merchant the efficiency of a loose-leaf system.

"Loose!" roared the merchant as he glanced at the disarray of papers. "Loose system, did you say? Let me tell you, young fellow, if you can produce a looser system than I've got right here, you're a genius!"

More truth than poetry in that.

* * *

We had a most delightful surprise in our office on the day before Thanksgiving. The expressman came in with a package from

Dowagiac, Michigan, prepaid, marked "perishable." Opening the parcel, there were two—in fact, out rolled several bunches of the best celery that Dowagiac has been able to grow, and that is saying a great deal, for in Dowagiac they certainly know how to grow celery. And whom had we to thank for thus making our Thanksgiving dinners doubly good? None other than our good friends the Rudy Furnace Company, Dowagiac, Michigan. And to them are many thanks due, and everyone in our organization appreciated the thoughtfulness of the senders very much indeed.

* * *

A. C. Selvig, Northwestern Stove Repair Company, is one of those happy souls who always takes things literally. The other day he parked his car on one of the streets in Chicago's crowded loop near one



of those round iron signs with writing on it. Before he could get out of the car a policeman spotted him and coming up to him said, "Say, don't you see the sign, 'Fine for parking'?" "Yes, sir," replied Mr. Selvig, "I was just taking advantage of it."

* * *

A Park Avenue apartment house in New York, which goes in for flunkies, recently blossomed out with a new doorman. When a gentleman called and asked to see Mrs. Brown, the new attendant, true to his calling, detained him with the customary, "But is Mrs. Brown expecting you?" The caller withered him with a glance. "My good man," said he, "Mrs. Brown was expecting me before I was born. She is my mother."

Ancient Hotel Annex Becomes Four Apartment Building, Heated With Warm Air

Fan System Used to Push Air Through Long Runs—Cold Airs Brought to Single Boot

By W. A. PEPPER*

THE fact that the nature of the warm air heating system is such that it can be readily adapted to fan work is making greater and greater

transformed into a four-apartment building at Jefferson City, Missouri, and heated with a battery of Homer warm air furnaces in conjunction

proaches the century mark. In its more balmy days, with its original four rooms, the structure was used as a hotel annex. Additions were made from time to time, which, of course, adds to the difficulties of the heating man in his attempts at modernizing.

This particular instance was no exception to the general rule, as practically the whole job of installing the system had to be a made-to-order proposition.

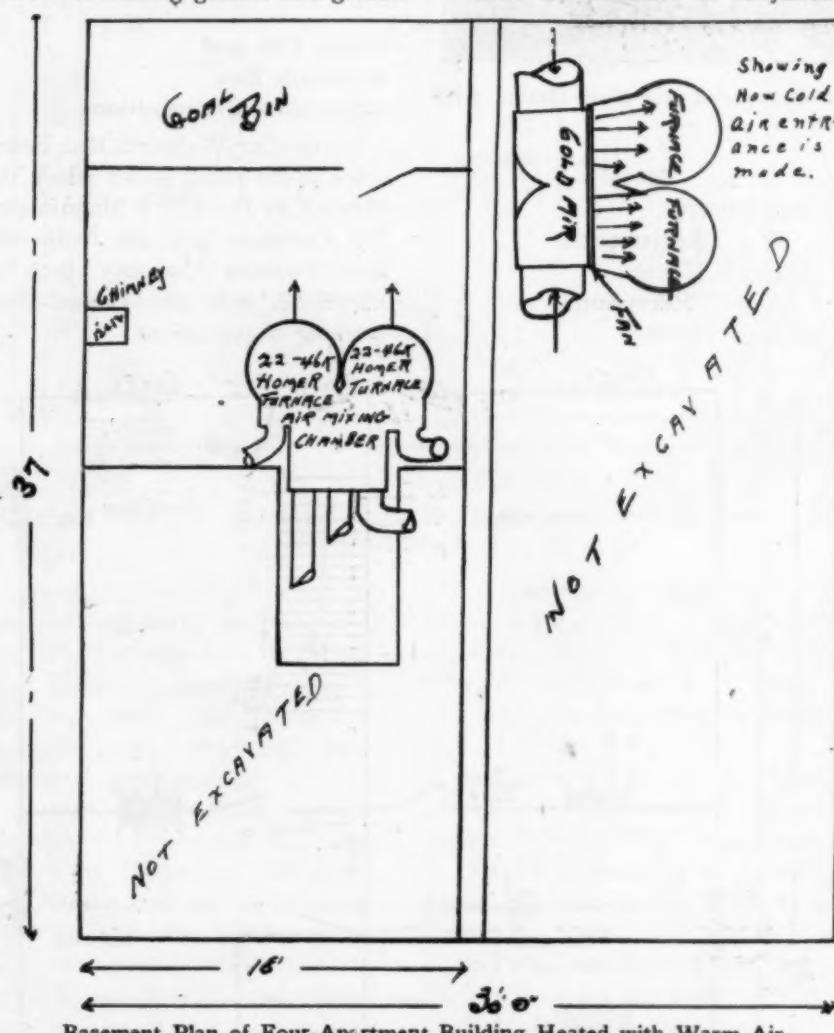
Right here allow me to interject parenthetically that during the past year or two much has been said, considerable has been done, and a great deal should now be done with this class of warm air heating.

There is no excuse now for a warm air heating plant in any building, regardless of its size, not heating if the air is properly circulated and sufficiently heated while it circulates.

In the present instance the furnaces were installed as shown on the illustrations and connected to a fan or heat booster to push the air through the ducts, although some of these were almost level.

Two furnaces were connected to the system in such a way that either one or the other can be cut out when it is not needed. All of the cold air is brought into one boot in the basement as shown. In making this arrangement we were lucky enough to find a place that seemed to have been made especially for us—an old stairway for the original four rooms. It was through this that we were able to run the cold air.

The pipe sizes used are as follows: one 8-inch pipe for one room; one 9-inch for two rooms; one 14-inch for four rooms; one 10-inch



Basement Plan of Four-Apartment Building Heated with Warm Air

strides in heating the larger type of buildings where formerly the warm air heating system was out of the question.

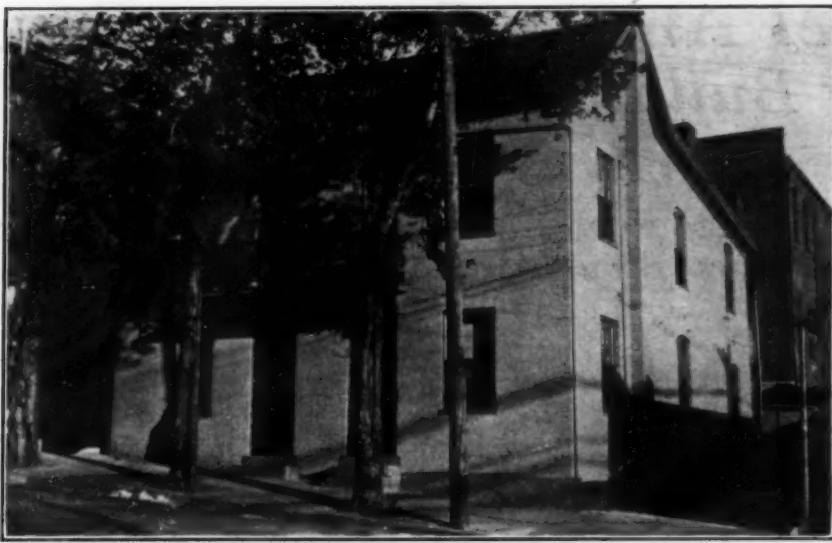
The accompanying drawings are those of an old brick structure

with a fan for positive circulation.

Here again the fan system helped to sell a very unusual job, the kind furnace dealers have been turning down because of the impossibility of installing a gravity system that would successfully do the work.

The building in which this installation was made is an old brick structure whose age rapidly ap-

*W. A. Pepper is special representative for the Homer Furnace Company, Coldwater, Michigan.



Exterior View of Four-Apartment Building Remodeled and Now Heated with Warm Air

for three rooms; one 12-inch for two rooms.

Throughout the system there are several dampers by means of which adjustments were made after the work was completed. The job now functions satisfactorily and the owner is very much satisfied.

Fur-Mets of Indiana Girding for Big Convention in January

The Fur-Mets of Indiana are whipping their forces into line and girding their loins for one of the most successful conventions their organization has held in a long time, according to Secretary Harry R. Jones, 308 Kenmore Road, Indianapolis.

The following appointments have been made by President Russell S. Thompson:

Entertainment

R. S. Thompson.
Robert Kruse.
Rolland Wilcox.

Program

George C. Joslin.
Chas. J. Pearson.

Finance

F. A. Wilkenning.
J. C. Henley.

Publicity

George J. Duerr.
E. C. Carter.
Etta Cohn.
Lee Gillespie.

Hotel

Jere Doherty.
Registration
Harry R. Jones.
Reception
George Thomas.

Creston Barnes.

Etta Cohn.

C. M. Fulton.

Karl Roth.

Thos. W. Pearson.

Banquet

F. A. Wilkenning.

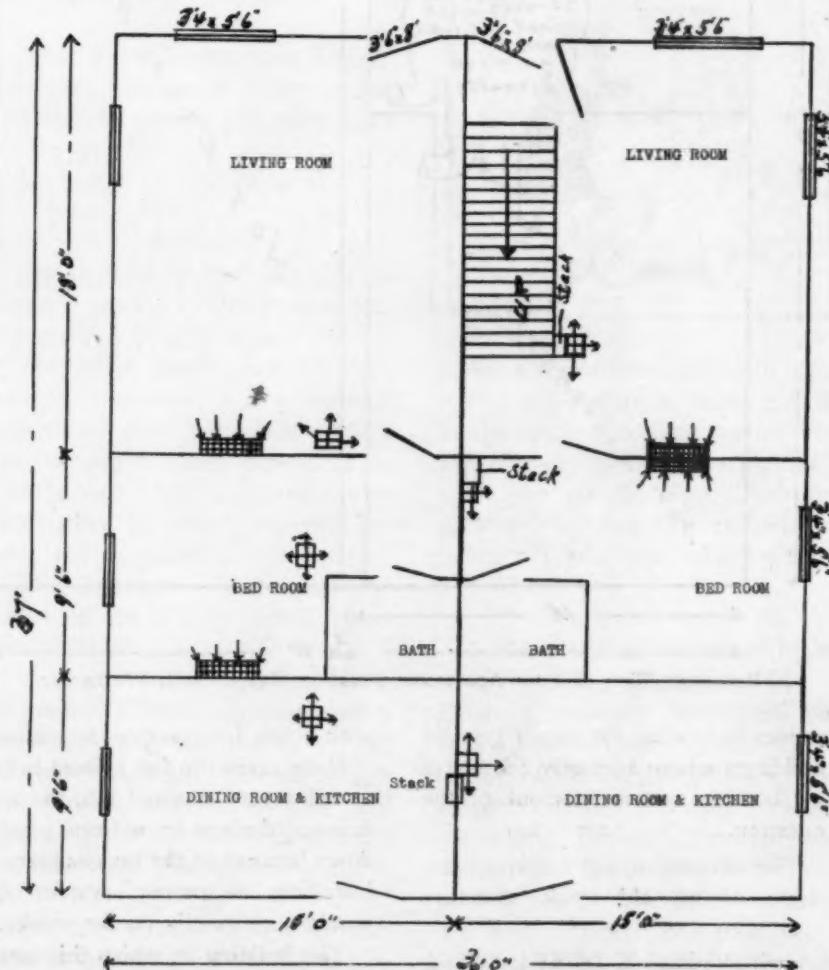
J. C. Henley.

R. S. Thompson.

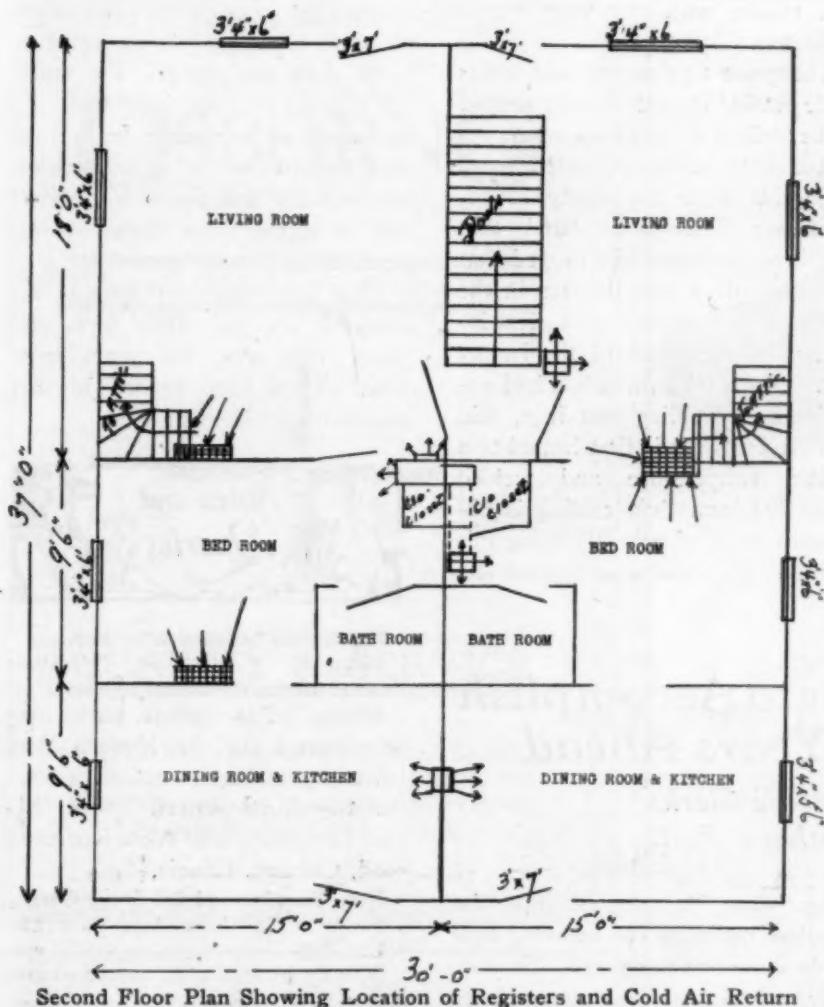
"Much activity is manifest in the three Indiana Associations, and it is believed that a large attendance will prevail at the coming meeting of the Associations," said Secretary Jones.

Forest City and Walworth Run Consolidate Organizations

Forest City-Walworth Run Foundries is the name under which the Forest City Foundry & Manufacturing Company and the Walworth Run Foundry Company, both of Cleveland, have consolidated their working organizations.



First Floor Plan of Four-Apartment Building, Showing Location of Warm Air Registers and Cold Air Return Faces



Second Floor Plan Showing Location of Registers and Cold Air Return Arrangement

Since 1903, when the Forest City company took over the Walworth Run foundry and later when another Walworth foundry, plant B, was purchased, the properties, under common ownership, have been operated separately.

A new office building will be erected at the Walworth Run plant, 2488 West Twenty-seventh street. P. J. Strangward will be chairman of the board of the new company; W. J. Strangward, president; C. E. Seelbach, vice president and general manager, and Walter L. Seelbach, secretary-treasurer.

Applications United States Civil Service Examinations for Heating Engineers Not Later than December 27

The United States Civil Service Commission announces the following open competitive examinations:

Associate Heating and Ventilating Engineer.

Applications for associate and assistant heating and ventilating engineers must be on file with the Civil Service Commission at Washington, D. C., not later than December 27.

The examinations are to fill vacancies in the office of the Quartermaster General, War Department, and vacancies occurring in different branches of the service throughout the United States.

For associate heating and ventilating engineer the salary ranges from \$3,000 to \$3,600 a year, and for assistant heating and ventilating engineer from \$2,400 to \$3,000 a year, the entrance salary depending upon the qualifications of the appointee and the duty to which assigned. In the District of Columbia the entrance salary is usually the minimum rate of the salary range for the position. A probationary period of six months is required; advancement after that depends

upon individual efficiency, increased usefulness, and the occurrence of vacancies in higher positions.

The duties will be in connection with original research or investigation, or design and construction, in heating and ventilating engineering.

Competitors will not be required to report for examination at any place, but will be rated on their education, training, and experience.

Full information may be obtained from the United States Civil Service Commission at Washington, D. C., or the secretary of the United States Civil Service Board of Examiners at the post office or custom house in any city.

British Metal Welders Discuss Testing Methods

Professor F. C. Thompson, University of Manchester, in his presidential address before a meeting of the Institution of Welding Engineers in London, Wednesday, October 12, devoted his attention to the changes which occur in iron as it cools from fusion down to room temperatures, to certain other effects of temperature, and to the effects of gases, says the *Iron Trade Review*.

Before dealing with the actual subject matter of his paper, Professor Thompson emphasized the fact that one of the hindrances to the fuller adoption of welding is that any given weld must to considerable extent be taken for granted. There is as yet no possibility of true testing other than that of service. There are, however, certain directions in which the testing of welds can be attempted.

In the first place, mechanical tests can be applied to a certain number of welded articles, which naturally will be destroyed without providing proof that the remaining articles are equal in quality. Testing methods which do not involve destruction can be applied, but there are weaknesses attached to these. Hydraulic pressure in general is excellent, but only certain types of welded articles are suitable for such tests. X-ray examination

is capable of detecting certain flaws, but only the more obvious ones; installation is costly, needs careful manipulation and is expensive. The speaker stated that he could not see that industry has much to hope for in X-ray examination.

Simple methods which could be used in the average plant are being investigated and there are chances of success in certain directions. One simple test is by electrically heating the article in the neighborhood of the weld and looking for hot spots, areas of high electrical resistance, indicative of flaws or inclusions. Other methods are being tried, including magnetic methods, and electrical resistivity measurements are among the most likely methods to

give results with this very simple apparatus.

The point was raised that welds made outside in cold weather proved to be defective, whereas when repeated in a normally heated room the welds were apparently sound. Professor Thompson stated that past investigations have proved that variations of a few degrees in the outside temperature have a great influence on the result of the impact test. One speaker, who had had experience in welding cast iron, said that the cast iron is first heated to a certain temperature and welded while hot, and then cooling is obtained very gradually. By using this method the results are generally good.

chooses his opportunity and when the time comes invests according to

He does not plunge. He waits, the dictates of good judgment. and while he is waiting he is loyal to his employer, he is industrious, he renders conscientious service, and he learns those things so important for him to know.

Plan how much you hope to accomplish one year from now, two years from now, five years from now. Then keep headed in that direction and keep moving.



Repairs for Modern Way Furnace
From E. E. Philpott, 205 West Center street, Warsaw, Indiana.

Please advise where parts may be obtained for the Modern Way furnace.

Ans.—Northwestern Stove Repair Company, 662 West Roosevelt road, Chicago, Illinois.

Bolo Gasoline and Oil Stove Oven
From C. M. Amspoker, East Liberty, Ohio.

Kindly advise who manufactures the Bolo gasoline and oil stove oven.

Ans.—Griswold Manufacturing Company, Erie, Pennsylvania.



National Warm Air Heating and Ventilating Association, Mid-year meeting, Urbana, Illinois, November 30 and December 1, 1927. Urbana-Lincoln Hotel headquarters. Allen W. Williams, 174 East Long Avenue, Columbus, Ohio, Secretary.

Western Warm Air Furnace & Supply Association, Sherman Hotel, Chicago, December 2nd and 3rd, 1927. Assistant Secretary, Oma B. Hussie, 3624 Lafayette Avenue, Omaha, Nebraska.

Kentucky Hardware & Implement Association, Seelbach Hotel, Louisville, Kentucky, January 17 to 20, 1927. Secretary-treasurer, J. M. Stone, 200 Republic Building, Louisville, Kentucky.

Michigan Sheet Metal & Roofing Contractors' Association, Kalamazoo, Michigan, March 5, 6, 7, 8, 1928. Secretary, Frank E. Ederle, 1121 Franklin Street, Grand Rapids, Michigan.

National Association of Sheet Metal Contractors of the United States, Hotel Statler, Cleveland, Ohio, May 22nd to 25th, 1928. Secretary, W. C. Markle, 336 Fourth Avenue, Pittsburgh, Pennsylvania.

Plan What You Wish to Accomplish One, Three, Five Years Ahead

Why Do Some Hardware Clerks Succeed Where Others Fail?

THE ambitious clerk has no fancy for letting the days slip by without definite and constructive plans for the future. Either he wants to advance in position and salary or to become a proprietor on his own account.

It is interesting, however, to note that a large percentage of the business failures are recruited from clerks who have gone into business for themselves. On the other hand, some of the outstanding business successes throughout the country have been achieved by men who were once clerks and who, when the time came, branched out on their own initiative.

What was the difference? Why did some succeed and others fail? Was it luck, or chance, or good management?

We can eliminate "luck" and "chance," for what may seem to be purely accidental happenings invariably have a very real cause which it is not difficult to trace.

The clerks who go into business and fail are rather certain to be easy-going chaps who never take the trouble to learn two important les-

sions. First, they do not grasp the absolute necessity for knowing how to do some one thing well. Second, they are not thorough enough to appreciate the importance of mastering all the details of a business and of co-relating these details.

This is the reason that so many young men who go into business for themselves without any clerking experience fail to make a good showing. The clerk has the advantage of learning a great deal which is of value, at the expense of his employer.

Why Some Succeed

The men who succeed are the ones who show results without unnecessary loss of time or cash. Training under an experienced business man is a great help. The clerk who is looking to the future learns to do the job which is his exceptionally well. He learns all he possibly can about the other branches of the business—credits, collections, buying, advertising, as well as selling. He finds out how this and that kind of merchandise is handled. He plans for capital and studies the financing of the business. Then he

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 New Orleans El Paso Salt Lake City

Round
 Corrugated



Plain Round



NEVER MADE WITHOUT THIS

TRADE F. Dieckmann MARK

Quality and Service Made 'em Famous

Made of one piece of heavy gauge material,
 in all styles and angles from 10 to 90
 degrees, of 24, 26, 28 ga. ternes, then
 galvanized after formation.

**DIECKMANN
 Elbows and Shoes**

*are the standard of the market
 and always give satisfaction*

Send for new catalogue 26 showing complete line

The Ferdinand Dieckmann Co.
 P. O. Station B, Cincinnati, O.

Square
 Corrugated
 Style A



Square
 Corrugated
 Style
 B

Not made lighter than
 28 ga. or 16 oz. copper.

Steel Market Registers Substantial Improvement—Heavy Finished Products Chief Beneficiary

Pig Iron Prices Unchanged—Non-ferrous Metal Market Is Stronger

CONFIDENCE in the long pull, which has been growing among producers of steel, received substantial reinforcement this week. Not only has new business displayed encouraging expansion, but fresh and prospective inquiry also has registered marked gains. Even in those departments of the industry which still tend to drag, the morale is noticeably better than it has been for some time.

Heavy finished steel products have been the chief beneficiary of this improvement, with an accompanying tendency toward firmness in price. The lighter steel products continue unstable in price and in comparatively light demand. The corrective of this condition—accelerated automotive buying—is believed closer. Demand for steel pipe continues at the record-breaking pace of recent weeks, purchasing of 1928 track material still is seasonably high, and freight car inquiry is the heaviest since mid-summer.

Operations of Steel Corporation subsidiaries average 69 per cent this week, a recession of two points. Curtailed schedules of independent producers, especially in the Mahoning valley, drag the national steel-making average down to 65 per cent. But if orders continue to develop from sources that appeared dried up a few weeks ago, operations may follow sentiment upward in the near future.

Pig Iron

Steel works and merchant furnaces claim to be adhering to \$17.50, valley, for the base foundry grade and claim the situation different than when the market stood at \$21 or even at \$19. They maintain prices now are at an irreducible minimum, one merchant stack asserting to be losing \$1 per ton on a \$17.50 market.

A sale of 100 tons of No. 3 foundry was made at \$17, valley. Sales of Bessemer show further shrinkage at \$18, valley. Basic is nominal at \$17, valley. Shenango resumed Nov. 19 after being banked 10 days.

At Chicago quiet buying of northern pig iron for nearby and first quarter shipment continues at a steady rate. Several additional large users have closed for January-February and first quarter iron. Practically no open inquiries are being issued from the Chicago buyers at the present time.

Several offers of 50 cents and \$1 a ton under the base price of \$18.50, Chicago furnace, are being made for boat iron to be delivered this season. At least one sale is reported at a price that figures \$1 below the base price.

For the first quarter and the bulk of spot orders, local furnaces are holding firmly to \$18.50 for No. 2 foundry and malleable. Silvery sales are light. Only scattered charcoal iron orders are reported from the market.

November sales of northern iron may prove the best in three months, according to sellers.

Buying of pig iron in Birmingham in the aggregate is considerably greater than two months ago. Delivery is steady. First quarter inquiry continues, but no base price has been announced and sales are not reported. Furnace interests say the \$16 on price for No. 2 foundry will be maintained on this year's delivery only.

Copper

All copper producers are firm at 13.75 cents, Connecticut, after recent sales at 13.50 cents to 13.62½ cents. For midwestern delivery prices are mostly about ½ cent over eastern. The export price has been

raised to 14.05 cents c.i.f. European ports.

Good business was done prior to the last advances and there are indications of further interest. Statistically and in sentiment the market is the strongest that it has been in a long time.

Zinc

Prime western zinc has sold at 5.80 cents East St. Louis, for this year and 5.85 cents for next quarter. Business has not been large but sufficient to be encouraging. Ore has recovered \$1 a ton to \$36.

Lead

Buying of lead has picked up in the past few days and the East St. Louis price has come closer to the New York price.

Tin

Prices of tin have gone up about 1½ cents in the past week with fairly active business, mostly futures. In the past few days buying has been large and at the highest prices in several weeks. Spot and futures are practically at one price, a relation that has not existed in several years. Supplies at present are plentiful.

Solder

Chicago warehouse prices on solder are as follows: Warranted 50-50, \$36.50; Commercial 45-55, \$33.50; plumbers', \$30.50; all per 100 pounds.

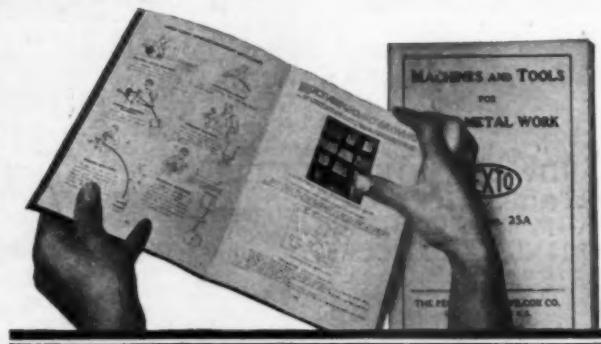
Old Metals

Wholesale quotations in the Chicago district, which should be considered as nominal, as follows: Old steel axles, \$15.00 to \$15.50; old iron axles, \$19.00 to \$19.50; steel springs, \$14.00 to \$14.50; No. 1 wrought iron, \$10.25 to \$10.75; No. 1 cast, \$12.00 to \$12.50, all per net tons. Prices for non-ferrous metals are quoted as follows, per pound: Light copper, 9 cents; zinc, 3½ cents; cast aluminum, 13¾ cents.

FREE FOR THE ASKING



THE LARGEST
MANUFACTURER
OF ITS KIND IN
THE WORLD



LIVE WIRE
DEALERS
ARE
EVERWHERE

GUIDE No. 25-A

MACHINES AND TOOLS FOR SHEET METAL WORK

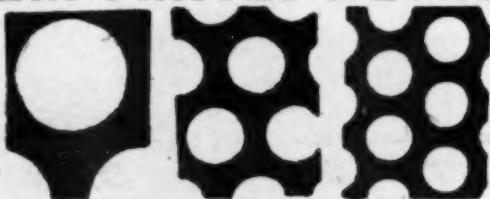
Get this splendid volume on file—consult it as frequently as the shop may call for new tools to make your product quicker, easier and better—then let the tools prove the sole judge of all claims made for them.

[108 Years
of conservative growth]

THE PECK, STOW & WILCOX CO.,

Southington Conn., U. S. A.

PERFORATED METALS



All Sizes and Shapes of Holes
In Steel, Zinc, Brass, Copper, Tinplate, etc.
For All Screening, Ventilating and Draining
EVERYTHING IN PERFORATING METAL

THE HARRINGTON & KING PERFORATING CO.
• 5649 FILLMORE ST.—CHICAGO, ILL., U. S. A.
• NEW YORK OFFICE 114 LIBERTY ST.

THIS MEANS SERVICE

B.B. LINE OF SHEET METAL SUPPLIES

CARRIED IN STOCK BY YOUR NEAREST JOBBER
INSURING PROMPT SHIPMENT OF QUALITY MATERIAL.

EVERY ITEM OF THE B. B. LINE IN A CLASS BY ITSELF. LOOK FOR THE B. B.

B. B. Conductor Hooks and Gutter Hangers, "SHUR-LOCK" Conductor Pipe, "E-Z Fit" Eaves Trough, "Quaker City" Mitres, Ends, Caps and Outlets. Other items in our No. 10 Catalog.

BERGER BROS. CO.

229 TO 237 ARCH ST.

PHILADELPHIA

The NEW IMPROVED "STANDARD"

ROTATABLE VENTILATOR

THIS favorite ventilator has been further improved to insure—

*Greater Durability
Quieter Operation
Greater Efficiency
Better Balance*

The New Cone-top Suspension, new Bronze Guide Bushings, and Cross-Braced Skirt are the new features. Let us tell you in detail all about this better ventilator.

Write for special circular and prices today

"Standard" Ventilator and Chimney Cap—
Most Efficient Combination on the market.

STANDARD VENTILATOR CO., Lewisburg, Pa.



The 12-Cylinder Ventilator
Used in Every State
in the Union.

ÆOLUS FOR HOMES

The home should be properly ventilated—few of them are. Here is a sales opportunity often overlooked by the average Sheet Metal Worker, but one which offers a lucrative business to those who take advantage of it.

Æolus-Dickinson

Vent Makers Since 1888
3332-52 South Artesian Avenue
CHICAGO

Phone: Lafayette 1862-1863

Chicago Warehouse Metal and Furnace Supply Prices

AMERICAN ARTISAN is the only publication containing Western Metal, Furnace Supply and Hardware prices corrected weekly.

METALS

PIG IRON

Chicago Fdy.	
No. 2	\$18.50
Southern Fdy. No. 2	22.01
Lake Superior Charcoal	27.04
Malleable	18.50

FIRST QUALITY BRIGHT TIN PLATES

1C	20x28 112 sheets	\$25.10
IX	20x28	29.60
IXX	20x28 56 sheets	16.20
IXXX	20x28	17.65
XXXXX	20x28	18.95

TERNE PLATES

	Per Box
IC	20x28, 40-lb. 112 sheets
IX	20x28, 40-lb. 112 sheets
IC	20x28, 25-lb. 112 sheets
IX	20x28, 25-lb. 112 sheets
IC	20x28, 20-lb. 112 sheets
IV	20x28, 20-lb. 112 sheets
IC	20x28, 15-lb. 112 sheets

"ARMCO" INGOT IRON PLATES

No. 8 ga.	up to and including 1/4 in.—100 lbs.	\$4.55
-----------	---	--------

COKE PLATES

Cokes,	80 lbs., base, 20x28	\$13.60
Cokes,	90 lbs., base, 20x28	13.80
Cokes,	100 lbs., base, 20x28	14.00
Cokes,	107 lbs., base, IC	
20x28		14.30
Cokes,	135 lbs., base, IX	16.40
Cokes,	155 lbs., base, 56 sheets	9.20
Cokes,	175 lbs., base, 56 sheets	10.05
Cokes,	195 lbs., base, 56 sheets	10.90

BLUE ANNEALED SHEETS

Base 10 ga.	per 100 lbs.	\$8.50
"Armco" 16 ga.	per 100 lbs.	4.90

ONE PASS COLD ROLLED BLACK

No. 18-20	per 100 lbs.	\$2.75
No. 22	per 100 lbs.	3.90
No. 24	per 100 lbs.	3.95
No. 26	per 100 lbs.	4.05
No. 27	per 100 lbs.	4.10
No. 28	per 100 lbs.	4.20
No. 29	per 100 lbs.	4.25
No. 30	per 100 lbs.	4.45

"ARMCO" GALVANIZED

"Armco" 24	per 100 lbs.	\$6.15
------------	--------------	--------

GALVANIZED

No. 16	per 100 lbs.	\$4.30
No. 18	per 100 lbs.	4.45
No. 20	per 100 lbs.	4.60
No. 22	per 100 lbs.	4.65
No. 24	per 100 lbs.	4.80
No. 26	per 100 lbs.	5.05
No. 27	per 100 lbs.	5.15
No. 28	per 100 lbs.	5.20
No. 30	per 100 lbs.	5.70

BAR SOLDER

Warranted 50-50	per 100 lbs.	\$26.50
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COMMERCIAL

45-55	per 100 lbs.	23.50
Plumbers	per 100 lbs.	26.50

ZINC

In Slabs		\$3.50
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SHEET ZINC

Cash Lots (600 lbs.)		\$12.00
Sheet Lots		13.00

BRASS

Sheets, Chicago base		17 1/4 c
Mill base		18 c
Tubing, brazed base		26 3/4 c
Wire, base		18 3/4 c
Rods, base		15 1/2 c

COPPER

Sheets, Chicago base		22 1/4 c
Bill Base		21 1/4 c
Tubing, seamless base		25 1/4 c
Wire, No. 8, B & S Ga.		18 1/4 c
Wire, No. 10, B & S Ga.		18 1/4 c
Wire, No. 11, B & S Ga.		19 1/4 c
Wire, No. 8, B & S Ga. and heavier		18 1/4 c

LEAD

American Pig		\$7.00
Bar		8.00
Pig Tin	per 100 lbs.	\$65.25
Bar Tin	per 100 lbs.	66.25

TIN

Adams' Sheet Metal		
7 inch, doz.		\$1.60
8 inch, doz.		2.20
9 inch, doz.		2.60
10 inch, doz.		2.80
12 inch, doz.		3.50
14 inch, doz.		5.00

Iwan's Hercules pattern,		
per doz.		14.90

Post Hole		
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Iwan's Split Handle (Eureka)		
4-ft. Handle...per doz.	\$14.00	
7-ft. Handle...per doz.	36.00	

Iwan's Hercules pattern,		
per doz.		14.90

DIGGERS		
---------	--	--

Post Hole		
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Iwan's Hercules pattern,		
per doz.		14.90

EAVES TROUGH		
--------------	--	--

Galv. Crimpedge, crated	75 & 5%	
Zinc, "Barnes"	60%	

ELBOWS		
--------	--	--

Conductor Pipe		
----------------	--	--

Galv. plain or corrugated.		
round flat Crimp.		
28 Gauge		60%
26 Gauge		45%
24 Gauge		15%

Square Corrugated		
-------------------	--	--

Partico Elbows		
----------------	--	--

Standard Gauge Conductor Pipe,		
plain or corrugated.		

Not nested		70 & 5%
Nested solid		70 & 5%

Sq. Corr. A. & B. & Octagon		
-----------------------------	--	--

CLIPS		
-------	--	--

Pointed Roofing		
-----------------	--	--

"Yankee" Hot Air		
------------------	--	--

7 inch, each 20c. doz.		\$1.75
8 inch, each 25c. doz.		2.40
9 inch, each 30c. doz.		2.75
10 inch, each 32c. doz.		3.00

SMOKE PIPE		
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Check and Collar Complete		

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SPECO
SOLID SAL AMMONIAC

SPECIAL CHEMICALS CO.
WAUKEGAN, ILLINOIS

GEROCK BROS. MFG. CO.
SHEET METAL ORNAMENTS
AND STATUARY
1252 So. Vandeventer Ave., St. Louis, Mo., U.S.A.
Write for Catalogue

ARMCO

Ingot Iron

Resists Rust
Works Easier
Reduces Labor Costs
Satisfies Customers

THE AMERICAN ROLLING MILL COMPANY
Middletown, Ohio

Export: The ARMCO International Corp.
Cable Address: ARMCO, Middletown.

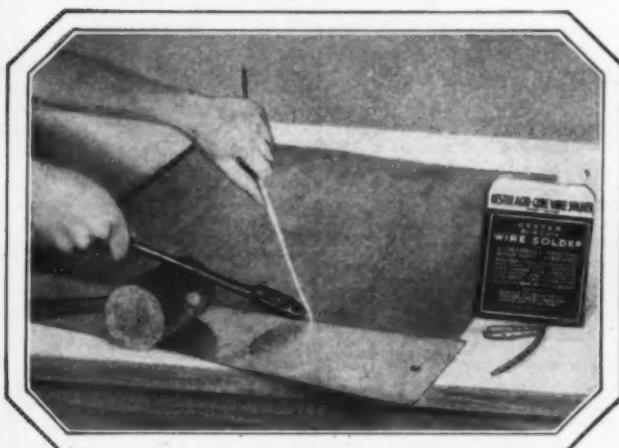
KESTER SOLDER

Self-Fluxing



(Underwriters' Laboratories Inspected)

"Requires Only Heat"



Flows Under the Seams

IT IS IMPORTANT in Sheet Metal work to have well soldered joints. A difficult job may be well handled to the finish—but if the soldering is weak, the work falls flat.

By using Kester Solder, you know your job will last. Inside of this hollow wire solder are tiny pockets full of scientifically prepared flux. This flows to the job just before the solder melts, and you guide it right where you want it.

This eliminates the old acid pot and saves one-third of the time together with labor and material. Kester figures a neat saving for the steady user.



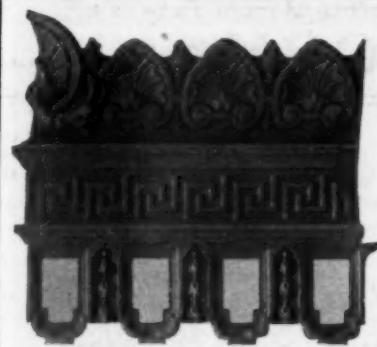
Kester Acid-Core Solder for general use in 1 lb. cartons; 1, 5 and 10 lb. spools. Small package Acid-Core Solder, Kester Metal Mender for autoist, householder, etc. For delicate radio and electrical work—Kester Rosin-Core Solder.

Manufactured by the
CHICAGO SOLDER COMPANY
4241 Wrightwood Ave.
CHICAGO, U. S. A.

ADVERTISERS' INDEX

The dash (—) indicates that the advertisement runs on a regular schedule but does not appear in this issue.

		<i>Markets—Continued from Page 174</i>	
		NETTING, POULTRY	
		Galvanized before weaving.....57½-5½ Galvanized after weaving.....52½-5½	
		PASTE	
		Asbestos Dry Paste: 200-lb. barrel.....\$16.00 100-lb. barrel.....8.75 25-lb. pail.....3.50 10-lb. bag.....1.10 5-lb. bag.....6.00 2½-lb. cartons.....35	
		PIPE	
		Conductor Cor. Rd., Plain Rd., or Sq.	
		Galvanized Crated and nested (all gauges).....75-2½% Crated and not nested (all gauges).....70-15%	
		Furnace Pipe Double Wall Pipe and Fittings.....40-10% Single Wall Pipe, Round Galvanized Pipe.....40-10% Galvanized and Tin Fittings.....40-10%	
		Lead Per 100 lbs.....\$12.50	
		Stove Pipe "Milcor" "Titelock" Uniform Blue	
		Stove 28 gauge, 5 inch U. C. nested.....11.50 28 gauge, 6 inch U. C. nested.....12.25 28 gauge, 7 inch U. C. nested.....14.25 30 gauge, 5 inch U. C. nested.....10.50 30 gauge, 6 inch U. C. nested.....11.25 30 gauge, 7 inch U. C. nested.....13.25	
		T-Joint Made up 6-inch, 28 ga.....per doz. \$5.00	
		All Zinc No. 11, all styles.....60%	
		POKERS, STOVE	
		W'r Steel, str't or bent, per doz. \$0.75 Nickel Plated, coll handles, per doz. 1.10	
		POKERS, FURNACE	
		Each.....\$0.50	
		PULLEYS	
		Furnace Tackle.....per doz. \$0.50 per gro. 6.00	
		Furnace Screw (enameled).....per doz. 75	
		Ventilating Register	
		Per gross.....9.00 Small, per pair.....30 Large, per pair.....50	
		PUTTY	
		Commercial Putty, 100-lb. Kits.....\$3.40	
		REDUCERS—Oval Stove Pipe	
		Per Doz. 7-6, 1 doz. in carton.....\$2.25	
		REGISTERS AND BORDERS	
		Baseboard, Floor and Wall.	
		Cast Iron.....20% Steel and Semi-Steel.....40% Baseboard.....40% Wall.....40% Adjustable Ceiling Ventilators 40%	
		Register Faces—Cast and Steel	
		Japanned, Bronzed and Plated, 4x6 to 14x14.....40% Large Register Faces—Cast, 14x14 to 38x42.....60% Large Register Faces—Steel, 14x14 to 38x42.....65%	
		RIDGE ROLL	
		Galv. Plain Ridge Roll, b'did.....75-10-5% Galv. Plain Ridge Roll crated.....75-10% Globe Finials for Ridge Roll.....50%	
		WRINGERS	
		No. 790, Guaranteeeach \$5.10 No. 770, Bicycleeach 4.70 No. 870, Domesticeach 4.25 No. 110, Brightoneach 3.70 No. 750, Guaranteeeach 5.10 No. 740, Bicycleeach 4.70 No. 22, Pioneereach 3.40 No. 2, Superbeach 2.65	



ARCHITECTURAL
SHEET METAL
ORNAMENTS

Made of
ZINC
COPPER
BRONZE
OR
LEAD
Also
METAL CEILINGS

SPECIALISTS IN SPECIAL WORK
ESTIMATES SUBMITTED ON RECEIPT
OF
BLUE PRINTS OR DRAWINGS

Ornamental Catalogue No. 50 on request

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Office: 733-737 So. Halsted St.
Factory: 761-771 Mather St.
CHICAGO ILLINOIS

Milwaukee Office: 853 Grant Blvd.

CHICAGO STEEL CORNICE BRAKES

STANDARD OF THE WORLD



THE BEST BRAKE
FOR ALL PUR-
POSES: Most Dur-
able, Easiest Oper-
ated, Low in Price;
Made in All Lengths
and to Bend All
Gauges of Metal.
Over 23,000 in use.

*WRITE FOR
PARTICULARS*

DREIS & KRUMP MFG. CO., 7404 Loomis Street, CHICAGO

THE learning and knowledge that we have
is, at the most, but little compared with
that of which we are ignorant.

—PLATO

Good trade books will without a doubt help you
to increase your practical knowledge of your
trade. We sell good trade books.

—AMERICAN ARTISAN

Send for catalog today

VIKING SHEAR
Compound LEVER Handle—Removable Blades
A child can work them
VIKING SHEAR CO., Erie, Pa.

Say you saw it in AMERICAN ARTISAN—Thank you!

VESUVIUS

BLOW TORCHES

in pint or quart sizes.

With quickly removable soldering iron
hooks.

Vesuvius Blow Torches are
made of brass or non-corrosive
oxydized terne plate. The lat-
ter is particularly recommended
for hard usage.

*Write for prices and illustrated
circular today*

QUICK MEAL STOVE COMPANY

Div. American Stove Company
825 Chouteau Ave. St. Louis, Mo.

NEW IMPERIAL No. 8 PUNCH

Operating handles will not become disen-
gaged. Roller Bearing. No cams
to wear out. Drop Forged. Just
right for standing seams or
skylight work.



CAPACITY
1" hole thru 1" iron.
Throat depth 2 1/2". Punch
in center 4 1/2".
Height of gap 1". Weight,
16 lbs. Length over all,
25 1/2".
*Write for catalog on
entire line.*

WHITNEY METAL TOOL COMPANY

93 FORBES ST., ROCKFORD, ILL.

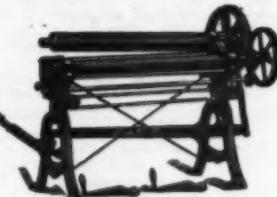
13

50-INCH FORMING ROLL

This Forming Roll is built in all
standard sizes, with our Patented
Opening Device by means of
which it is opened and closed in
a few seconds.

We build a complete line of Shears
and punches, all sizes, for hand or
belt power.

Write for Catalog "R"
BERTSCH & CO., Cambridge City, Ind.



**VAIL'S ADJUSTABLE
CAST IRON SWING CHIMNEY TOP**
Fits any size stack—6" to 10" inclusive.
Inexpensive, simple and durable. Satis-
faction guaranteed.
Write for Circulars and Prices
VAIL MANUFACTURING CO.
1017 Columbia Ave. Fort Wayne, Indiana

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Acetylene (Gas) Dissolved.	Elbows and Shoes—Conductor.	Machines—Tinsmiths.
Prest-O-Lite Co., Inc., New York, N. Y.	Barnes Zinc Products Co., Chicago, Ill.	Bertsch & Co., Cambridge City, Ind.
Air Filters.	Dieckmann Co., Ferdinand, Cincinnati, Ohio	Burton Co., The W. J., Detroit, Mich.
Reed Air Filter Co., Louisville, Kentucky	Double-Duty Mfg. Co., Aurora, Ill.	Chicago Elbow Machine Co., Oak Park, Ill.
Bale Ties.	Lupton's Sons Co., David, Philadelphia, Pa.	Dreis & Krump Mfg. Co., Chicago, Ill.
American Steel & Wire Co., Chicago, Ill.	Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City	Marshalltown Mfg. Co., Marshalltown, Iowa
Blowers.	Engineering—Fan Blast Warm Air Heating	Osborn Co., The J. M. & L. A., Cleveland, Ohio
Sturtevant Co., B. F., Boston, Mass.	Herbert H. Davis Co., Inc., Chicago, Ill.	Peck, Stow & Wilcox Co., Southington, Conn.
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Ryerson & Son, Inc., Jos. T., Chicago, Ill.	American Steel & Wire Co., Chicago, Ill.	Metals—Perforated.
Brakes—Cornice.	Fittings—Conductor.	Harrington & King Perforating Co., Chicago, Ill.
Dreis & Krump Mfg. Co., Chicago, Ill.	Barnes Zinc Products Co., Chicago, Ill.	Miters.
Brass and Copper.	Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City	Friedley-Voshardt Co., Chicago, Ill.
Copper & Brass Research Association, New York	Flue Thimbles.	Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Merchant & Evans Co., Philadelphia, Pa.	Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City	Miters—Eaves Trough.
Cans—Garbage.	Furnace Cement—Asbestos.	Barnes Zinc Products Co., Chicago, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio	Armstrong Co., The, Detroit, Mich.	Lupton's Sons Co., David, Philadelphia, Pa.
Castings—Malleable.	Buckeye Products Co., The, Cincinnati, Ohio	Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Fanner Mfg. Co., Cleveland, Ohio	Connors Paint Mfg. Co., Wm. Troy, N. Y.	Nails—Hardenized Masonry.
Ceilings—Metal.	Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City	Parker-Kalon Corp., New York, N. Y.
Burton Co., The W. J., Detroit, Mich.	Pecora Paint Co., Philadelphia, Pa.	Nails—Wire.
Friedley-Voshardt Co., Chicago, Ill.	Furnace Cement—Liquid.	American Steel & Wire Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City	Technical Products Co., Pittsburgh, Pa.	Nitrogen (Gas).
Wheeling Corrugating Co., Wheeling, W. Va.	Furnace Cleaners—Suction.	Linde Air Products Co., New York, N. Y.
Chaplets.	Brillion Furnace Co., Brillion, Wis.	Ornaments—Sheet Metal.
Fanner Mfg. Co., Cleveland, Ohio	Sturtevant Co., B. F., Boston, Mass.	Friedley-Voshardt Co., Chicago, Ill.
Chimney Tops.	Furnace Fans.	Geroch Bros. Mfg. Co., St. Louis, Mo.
Standard Ventilator Co., Lewisburg, Pa.	A. H. Robinson Company, Massillon, Ohio	Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Vall Mfg. Co., Fort Wayne, Ind.	Robinson Furnace Co., Chicago	Oxygen (Gas).
Check Drafts.	Sturtevant Co., B. F., Boston, Mass.	Linde Air Products Co., New York, N. Y.
Teela Sheet Metal Co., Oshkosh, Wis.	Warm Air Furnace Fan Co., The, Cleveland, Ohio	Paint.
Clinker Tongs.	Furnace Rings.	Connors Paint Mfg. Co., Wm. Troy, N. Y.
L. J. Mueller Furnace Co., Milwaukee, Wis.	Milwaukee Corrugating Co., Milwaukee, Wis.	Pecora Paint Co., Philadelphia, Pa.
Clips—Roofing.	Walworth Run Fdy., Cleveland, Ohio	Patterns—Furnace & Stove.
Wm. Pfeifer, New York, N. Y.	Furnaces—Gas.	Cleveland Castings Pattern Co., Cleveland, Ohio
Coal Chutes.	Calkins & Pearce, Columbus, Ohio	Quincy Pattern Co., Quincy, Ill.
Majestic Co., The, Huntington, Ind.	Furnaces—Warm Air.	Vedder Pattern Works, Troy, N. Y.
Copper.	Agricola Furnace Co., Gadsen, Ala.	Pipe and Fittings—Furnace.
Copper & Brass Research Association, New York	American Furnace Co., St. Louis, Mo.	Burton Co., The W. J., Detroit, Mich.
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Friedley-Voshardt Co., Chicago, Ill.	Brillion Iron Works, Brillion, Wis.	International Heater Co., Monroe, Mich.
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AMERICAN ARTISAN

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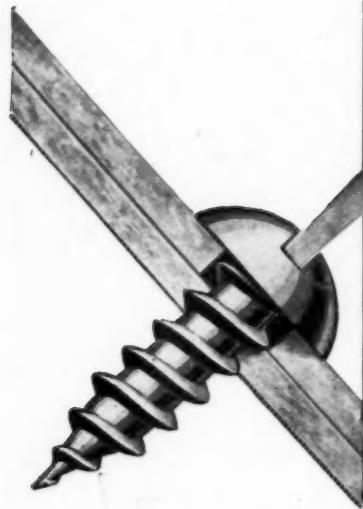
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1st. Punch or drill a hole as in Fig. 1; or pierce a hole as in Fig. 2.



FIG. 2



2nd. Turn in the Screw with a screw driver

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We take our hats off to G. S. Grochowski, proprietor of the Progress Roofing Co., Chicago, for one of the finest jobs ever accomplished with Milcor Copper Spanish Tile. The un-retouched pictures shown above tell the story.



Credit is due also to Mrs. Grochowski, who "discovered" Milcor Spanish Tile in the Milcor Architectural Sheet Metal Guide. She recognized the beauty of this type of roof and knew that pure copper never wears out.

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